

A Guide to Vision Aid Apps for Apple and Android Smartphones

High technology for low vision has changed a lot in the last 2 decades—moving from an emphasis on heavy, costly hardware to the ascendance of inexpensive software for portable computing devices.

A wealth of cheap apps. “Smartphones and tablets are creating new opportunities for people with vision loss. Through these mobile devices, preinstalled and downloadable apps can help replace the need for costly stand-alone assistive technology products,” said Lee Huffman, manager of technology information at the American Foundation for the Blind (AFB).

Your role as a resource. “By and large, the reason that most ophthalmologists need to be aware of low vision aids is simply that they’re taking care of these patients, and I feel that we should be a resource for them,” said Richard A. Harper, MD, a low vision specialist at the University of Arkansas for Medical Sciences, in Little Rock. “Even if we don’t know the specifics [about assistive technologies, including smartphone apps], at least we should be able to point patients in the right direction to find the tools they need.”

Start with a referral for a low vision evaluation. The best way to ensure patients attain maximal function and independence is to refer them to a vision rehabilitation clinic where they will receive a range of services, such as individualized counseling and home

visits to help with activities of daily living and safety. However, these clinics aren’t always available, said Dr. Harper, noting that the Academy had developed the SmartSight initiative to inform community practitioners about how to recognize and help patients with low vision (see “Key Resources”).

Vision Aids on a Budget

Terry L. Schwartz, MD, said her patients enthusiastically embrace a high-tech, low-cost approach. “We are really excited about technology, and visually impaired kids are, too. Even before we have a chance to evaluate these children, they’ve already figured out that by taking smartphone pictures, they can magnify objects to see them better,” said Dr. Schwartz, a pediatric ophthalmologist who is director of the visual rehabilitation program at the Cincinnati Children’s Medical Center.

Apps are not for everyone. While apps have been embraced by many younger patients, they might not prove so useful for others—particularly those who can’t afford a smartphone, patients with poor hand-eye coordination or orthopedic problems, the elderly, and technophobes of all ages.

Apple iOS vs. Google Android. So far, the iPhone (Apple) has been the most popular smartphone among low vision patients, said Mr. Huffman. This is “because of the built-in accessibility of the VoiceOver [text-to-speech]

feature and of Siri for voice commands. Accessibility of Android devices is improving, but they’re not there yet.”

The smartphone/tablet apps highlighted below are among those that sight-impaired people find most helpful, the 3 experts said. (Except where specified, all these apps are available in versions for both Android and iOS [Apple] devices.)

Apps for School and Office

Join.Me. Although this app was developed as a business tool for video conferencing, Dr. Schwartz said that it has become a favorite among the tech-savvy middle and high school students in her low vision practice. In class, their teachers use an electronic whiteboard that is hooked up to a computer and projector. It works like this: Instead of using a marker, teachers use a stylus (or their finger) to write and draw; the touch-sensitive whiteboard relays the stylus’ movements to the computer; and the resulting text and diagrams are projected onto the whiteboard. With the Join.Me app, the low vision patient can use a smartphone or tablet to view whatever is on the board in real time.

“They can participate fully in the class without having to sit at the very front or use a big magnifier that makes them stand out as ‘different’ from everyone else,” Dr. Schwartz said. “At this age, they would much rather not see than be rejected by their peers.” (Free; LogMeIn; www.join.me.)

Genius Scan. This app uses the mobile device’s camera to capture and enhance images of documents as JPEG

or PDF files. (Free or \$6.99 for ad-free version; Grizzly Labs; www.thegrizzlylabs.com.)

GoodReader. This file-viewer app can be used to enlarge PDFs for reading, annotating, editing, signing, and organizing them in folders. (\$4.99; Good.iWare; www.goodreader.com.)

AccessNote. Designed specifically to enable efficient note-taking by blind or visually impaired people, AccessNote's screens are uncluttered for easy navigation with voice commands and keyboard shortcuts. It can connect by Bluetooth to a wireless keyboard or Braille input device. (Free; AFB; www.afb.org.)

Notability. This note-taking app allows users to combine typed text, handwriting, and photos; zoom in for better viewing; link notes to concurrent recordings; and add audio comments. When used with PDF text documents, the app can be used to highlight, copy and paste, and search text, and—currently for iOS only—the user can select a passage of the PDF's text and have the app read it out loud. (\$5.99; Ginger Labs; www.gingerlabs.com.)

Apps for Daily Living

BlindSquare (iOS only). Blind users of Apple devices often choose BlindSquare to help them navigate outdoors, Mr. Huffman said. Using a dedicated speech synthesizer, the app interprets real-time GPS data from FourSquare and the Open Street Map database to describe the environment and announce points of interest and street intersections as the user travels. (\$29.99; MIPsoft; www.blindsquare.com.)

LookTel Recognizer (iOS only). This app identifies everyday items, such as food packages, DVDs, and ID or credit cards, by comparing the view through the phone's camera lens to a user-generated library of photographed objects, which is stored on the device. Works without an Internet connection. See a demo at www.youtube.com/watch?v=EXkSHh9GRbo. (\$9.99; Ipplex; www.looktel.com.)

TapTapSee (iOS only). This mobile app was designed specifically for the blind and visually impaired. The user double-taps on the screen to photo-

graph any 2- or 3-dimensional object at any angle and have it analyzed and defined. The device's voice synthesizer then provides the identification audibly. The app requires an Internet connection and can take several seconds to identify the object. See a demo on YouTube at www.youtube.com/watch?v=Cd4SPDUfj-A. (Free; CamFind; www.taptapseeapp.com.)

CamFind. Although its developers promote this app as a tool for comparison shopping on the Internet, sight-impaired patients have repurposed it to meet low vision needs. The user takes a photo of an object, CamFind compares the photo to known Internet images, and the device's synthesized voice announces the identification. (Free; CamFind; www.camfindapp.com.)

KNFBReader. Despite being more expensive than competing apps, KNFBReader is popular because it enables people with limited vision to access written information of all types, especially while on the go, Mr. Huffman said. The user photographs the material—such as a sign, restaurant menu, or class handout—and the app's

text-to-speech function quickly reads it out loud. "There are similar apps out there, but from our experience, the KNFBReader appears to be the most accurate," Mr. Huffman said. (\$99.99; Sensotec; www.sensotec.be.)

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Mr. Huffman is technology information manager, as well as editor of AccessWorld magazine, for the AFB, in Huntington, W.V. *Relevant financial disclosures: None.*

Dr. Schwartz is a professor of pediatric ophthalmology and adult strabismus, and director, Cincinnati Children's Vision Rehabilitation Program at the Abrahamson Pediatric Eye Institute, Cincinnati Children's Hospital Medical Center, University of Cincinnati College of Medicine, in Cincinnati. *Relevant financial disclosures: None.*



MORE ONLINE. To read about vision rehabilitation, cash identification apps, and talking prescription labels, see this article at www.aao.org/eyenet.

Key Resources

SmartSight. This Academy initiative is aimed at helping members assist their patients who have visual acuities of less than 20/40 or who have scotomata, field loss, or contrast loss. Download a free patient handout and clinical guidelines at www.aao.org/smart-sight-low-vision.

American Foundation for the Blind. The AFB's patient-oriented website offers a number of services, including the following:

- It answers questions that patients have about assistive technology and includes video demonstrations of the different options. See www.afb.org/info/living-with-vision-loss/using-technology/12.
- It features a searchable U.S./Canada database of services for low vision patients that is called VisionConnect. This is also available as a mobile app at www.afb.org/info/living-with-vision-loss/using-technology/download-afb-apps/visionconnecttm-app/1235.
- It allows ophthalmologists to order a free packet of patient brochures about the AFB's VisionConnect app at www.afb.org/store/Pages/Shopping-Cart/ProductDetails.aspx?ProductId=PrescriptionPads&ruling=Yes.

AppleVis.com. This website is published by sight-impaired users of Apple devices to help other low vision patients find the right assistive apps. A list of the smartphone apps and games that site visitors have reviewed and recommend is at www.applevis.com/ios-app-directory/recommended/most.

Eyes-Free Project (Android only). A team of Google developers has produced several free low vision apps for Android smartphones and tablets. Find them by searching for "Eyes-Free Project" at <https://play.google.com>.