

# Connect and Discover




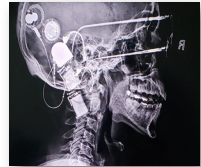
## Hearing Access Technologies and Digital Accessibility

Dr. Tina Gonzales Childress

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### Who am I?

- Audiologist
- Accessibility Consultant for InnoCaption
- Late-Deafened
- Bilateral cochlear implants
- Speak and/or sign
- “Techy Tina”
- Active on local and national Boards, Organizations and Committees
- Advocate



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## Assistive Listening Devices



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### Venues



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## Sound transmission options

Individual /  
small group

- DM
- 2.4 GHz
- Bluetooth

Medium / large  
area

- Induction (hearing/room loops)
- Radio Frequency
- Infrared
- Audio over WiFi
- Bluetooth LE Audio (aka Auracast)



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## Applications

	Radio Frequency	Infrared	Induction	Audio over WiFi	Bluetooth / Auracast
Theaters	✓	✓	✓	✓	✓
Outdoor spaces	✓			✓	✓
Segmented indoor spaces		✓	✓	✓	✓
Small areas		✓	✓	✓	✓
Large areas	✓			✓	✓



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## DM (digital modulation)

- Formerly known as FM (frequency modulation) which was analog



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## 2.4 GHz



Cochlear/ReSound  
Mini Mic 2+ and Phone Clip

MED-EL  
AudioLink

Oticon  
ConnectClip



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## Radio Frequency

- Sometimes referred to as FM
- Radio waves transmit the audio typically on the 72 MHz, 216 MHz frequency bands
- This technology can be stationary or portable and has a range of up to 3,000 feet
- Receivers are required



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## Infrared

- Audio is transmitted by line of sight and keeps audio contained in a space, but is easily expandable by adding emitters
- Does not work outside
- Receivers are required



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## Induction

- The system is often called a hearing loop or room loop – there are also portable loops
- An induction driver feeds an audio source through a copper cable that is installed in floor and ceilings of a room that creates a magnetic induction field that transmits the audio to a telecoil (t-coil) hearing aid or cochlear implant
- If the patron has a t-coil setting, they can stream the audio directly to their hearing aid(s) or cochlear implant(s) by turning t-coil "ON" by sitting within the looped area
- Receivers are required for listeners who do not have t-coil setting (but most devices do)
- Favorite user-friendly resource - <https://www.hearingloss.org/programs-events/get-hearing-loop/>



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## Audio over WiFi

- This newer technology transmits audio over Wi-Fi to a receiver or a mobile app available on smartphones
- The ability to connect to smartphones provides the option for patrons to use their own device and connect to Bluetooth headphones, hearing aids, and cochlear implants
- Prone to bandwidth problems and lags




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### Coupling options to receiver

- Cupped headphones
  - avoid flat style
  - avoid under-the-chin bar headphones
- Neckloop
  - accessed via the telecoil setting
- Earbuds




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### Bluetooth/Auracast on the horizon



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### Accessibility



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### Things that you need to know

- What phone and model do you have?
  - More complicated for Android (Pixel, Samsung, Motorola, LG, etc.)
- Do you upgrade your phone when scheduled?
- Do you regularly upgrade your apps?

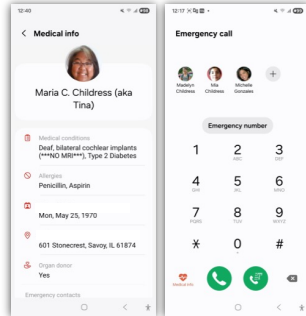


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## In Case of Emergency (ICE)

- Communication needs
- Medical information
  - Cochlear implant – NO MRI
  - Medications
  - Allergies
  - Other conditions
  - Organ donor
- Emergency Contacts



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	Apple	Android
Speech-to-text transcription	Live Captions	Live Transcribe
Live captioning of media	Live Captions	Live Caption
Live captioning of phone calls and video calls	Live Captions	Live Caption
Environmental sound awareness	Sound Recognition	Sound Notifications
Type to Siri	•	
Music haptics	•	
Lyrics to Music	•	
Understand non-standard speech	Vocal shortcuts	Relate
Add captions to video	•	

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	Apple	Android
Mirror watch to phone	•	
Background sounds (e.g., tinnitus masker)	•	
Measure noise levels	Apple Watch	
Mono audio	•	•
Customized sound	•	•
Auracast		•

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## iOS Accessibility Settings > Accessibility > Hearing

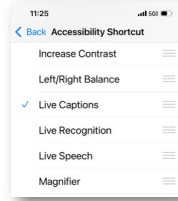
<https://www.apple.com/accessibility/hearing/>

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## Live Captions

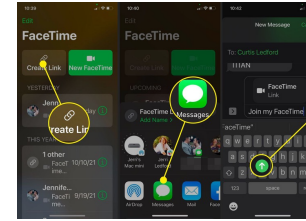
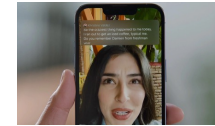
- iPhone 11 and later, iPhone SE (2nd & 3rd Gen)
- Speech-to-text (AI)
- Caption phone calls, video/FaceTime and media
- Works offline
- Works with Apple Watch
- Use the shortcut!



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## FaceTime

- Allows you to hear, lipread and read captions
- Can make calls to non-iOS devices



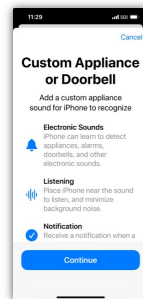
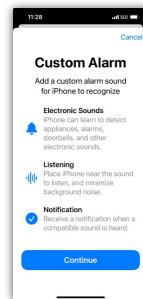
<https://support.apple.com/en-us/109364>



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## Sound Recognition

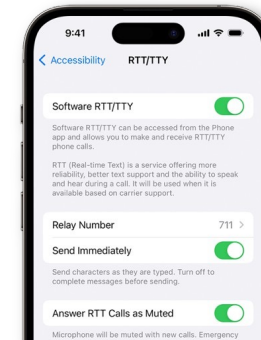
- Alarms
  - Fire, Siren, Smoke, **Custom** (e.g., CO)
- Animals
  - Cat, Dog
- Household
  - Appliances, Car Horn, Door Bell, Door Knock, Glass Breaking, Kettle, Water Running, **Custom**
- People
  - Baby Crying, Coughing, Shouting



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## RTT/TTY

- Can communicate with people who use TTYs
- Contact Emergency Call Centers when Text-to-911 not available
- Hear, talk and/or type



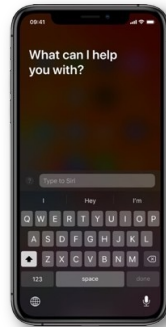
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## Siri



- Great for speech feedback
- Can also Type to Siri
- “Siri – what’s this song?”



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## Music Haptics



- Vibrotactile feedback for music
- Will eat up battery life

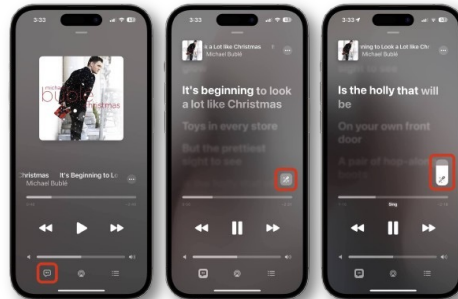


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## Apple Music Sing (aka Karaoke mode!!!)



- Lyrics are synced with music
- Adjust background or main voice
- Multiple lyrics shown for duets

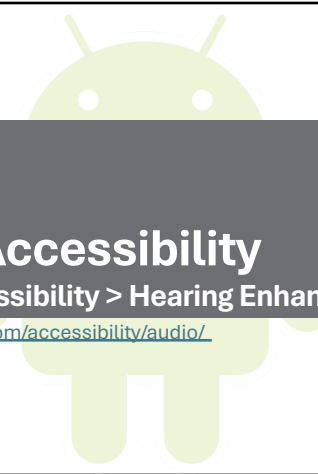


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## Android Accessibility

Settings > Accessibility > Hearing Enhancements

<https://www.android.com/accessibility/audio/>



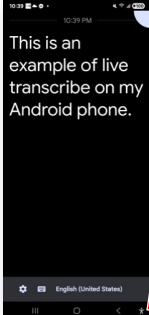


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## Live Transcribe



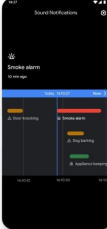

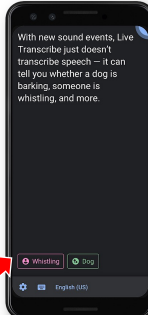
- Free on Android only
  - iPhone Live Transcribe is NOT the free Google one, subscription
- Speech-to-text (AI)
- Save transcript
- Can rotate screen to landscape
- Can caption many languages (does not subtitle/translate)
- Works offline
- Turn on Accessibility Shortcut!
- Collaboration with Gallaudet



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## Live Transcribe Sound Notifications



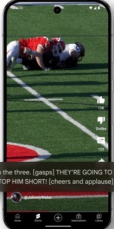
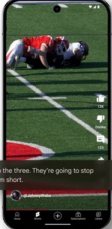


- Smoke and fire alarms, siren, shouts, baby sounds, doorbell rings, knocks, dog barks, appliance beeps, running water, landline phone rings
  - Does better with repetitive sounds and mechanical (not digital sounds)
  - NOT customizable
- Can view on Live Transcribe screen, separate screen and/or on Android watch



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## Live Caption

- Phone calls
- Video calls
- Media
- Expressive Captions



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## Other Apps



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## InnoCaption App

**Caption mode (AI/Stenographer)**  
**Text-to-Speech (AI Refine)**  
**AI Summary (Call Transcript)**  
**InnoCaption Web**

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## Other Speech-to-Text Apps

**Otter.ai (free up to 300 min/mo) iOS or Android**  
**Notes (free)**  
**NALscribe (free)**  
**Flip-Talk (free)**

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## Make It Big

- Can save messages you use often
- Apple or Android

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## Everyone uses their own device (multiple devices)

**Microsoft Translator \*free \*conversation mode**  
**AI-Table \*free \*iOS**  
**BeamScribe \*free/subscription \*iOS**  
**Ava \*subscription**

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## Translation

Microsoft Translator (free) Google Translate (free)

Translate images!

營養標示	
每100毫升含	
熱量	43 大卡
蛋白質	0.1 公克
脂肪	0 公克
飽和脂肪	0 公克
反式脂肪	0 公克
碳水化合物	10.7 公克
鈉	29 毫克

Content per 100ml	
Sugar	0.1 grams
protein	0.1 grams
Fat	0 grams
saturated fat	0 grams
trans fat	0 grams
carbohydrate	10.7 grams
Na	29 mg

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## Accessories

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## How can I be alerted when I'm sleeping?

- Serene Innovations Cell Phone Ringer Amplifier & Telephone Ringer Amplifier with Bed Shaker
  - Does better with sustained or repetitive vibration

RF-200 (stand alone) CA-380 (part of system)

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## Wireless microphones

- Improves accuracy for speech-to-text (AI) in noisy or group situations

<https://bit.ly/WirelessMicRecsdDHL>

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## Solar power banks (when there's no electricity)

<https://amazon.to/4ep0l9M>

<https://amazon.to/45oVboq>

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## Videoconferencing

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## <http://bit.ly/DHHFriendlyVideoconferenceOptions>

Click on the [hyperlinks](#) in this document for instructions on how to use/enable these features

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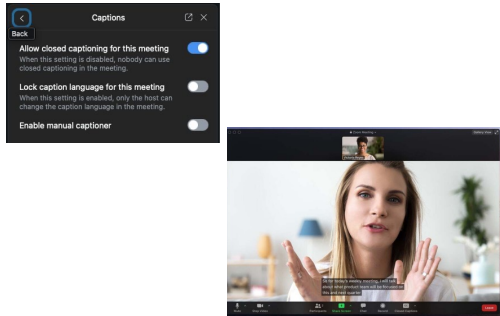
	zoom	Microsoft Teams	webex by CISCO	Google Meet
	<a href="#">Accessibility Page</a>	<a href="#">Accessibility Page</a> <a href="#">Best Practices for DHH</a>	<a href="#">Accessibility Page</a>	<a href="#">Accessibility Page</a>
<b>Captioning</b>				
3rd party captioner can be integrated into the program (e.g., CART, ASR)	±	±	±	(only with separate browser link)
Platform has its own ASR captioning	±	±	±	±
Attendee can start/stop captions independently	(NOTE: <a href="#">host can also disable captions</a> )	±	<a href="#">host must enable first</a>	±
Speaker identification (when people are using separate microphones)	•	•	•	•
Transcript available within program	±	±	±	(subscription plans only)
External tool(s) for transcripts				<a href="#">Tactiq Chrome Extension</a> <a href="#">Otter.ai Chrome Extension</a>
Can move captioning on screen	±	(top or bottom only)	±	<a href="#">Tactiq Chrome Extension</a> <a href="#">Otter.ai Chrome Extension</a>
How to change how the captions look	±	±	±	(no)
Captioning available on web browser version	±	±	±	±
Can caption breakout rooms	•	•	(no)	(subscription plans only)
Has dial-in number	±	±	±	±
Remote Conference Captioning (RCC) can be integrated - varies by state	±	±	±	±
Picture-in-picture mode	±	±	±	±

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## Zoom

- Host can now enable captions from a meeting
- Moveable and resizable caption box
- Transcripts can be saved
- Can use with CART

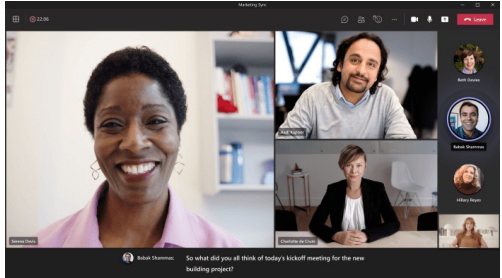


The image shows the Zoom captions settings menu on the left, which includes options for 'Allow closed captioning for this meeting', 'Lock caption language for this meeting', and 'Enable manual captioneer'. To the right is a screenshot of a Zoom meeting with a woman speaking and a caption box at the bottom of her video feed.

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## Microsoft Teams

- Captions are always at the bottom

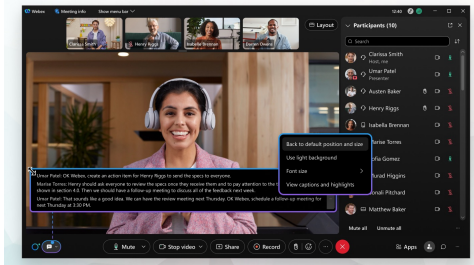


The image shows a Microsoft Teams meeting interface. A woman is in the main video view, and other participants are in a gallery view on the right. Captions are displayed at the bottom of the screen, below the video feeds.

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## WebEx

- Moveable captions

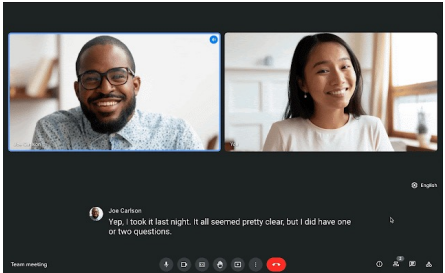


The image shows a WebEx meeting interface. A woman is in the main video view, and other participants are in a gallery view at the top. Captions are displayed in a separate, moveable window in the foreground.

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## Google Meet

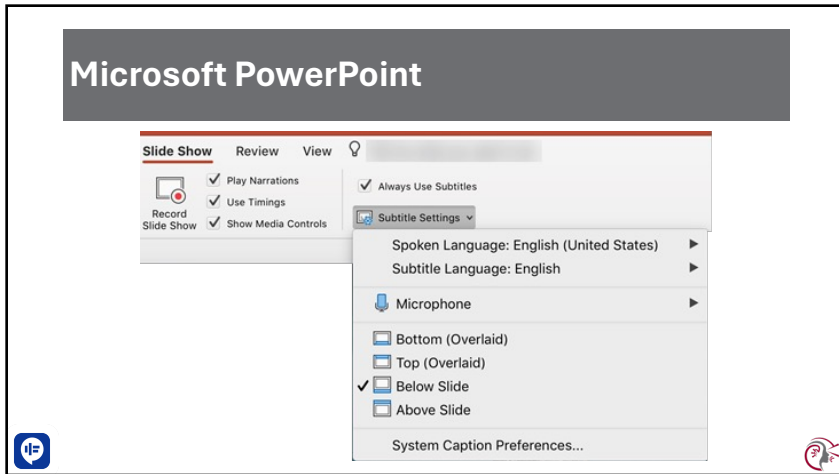
- Browser-based
- Captions always at the bottom
- CART would have to be viewed in another window
- Most limited in terms of videoconference captioning IMO



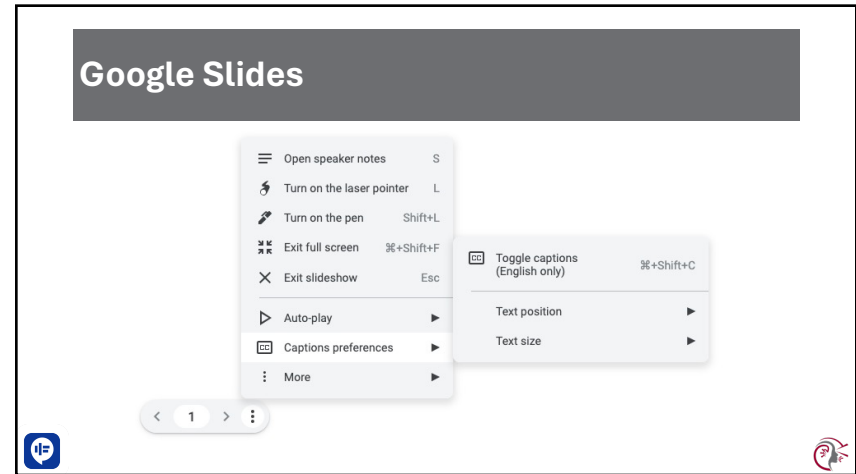
The image shows a Google Meet meeting interface. Two participants are in the main video view. Captions are displayed at the bottom of the screen. A chat window is open on the right side.

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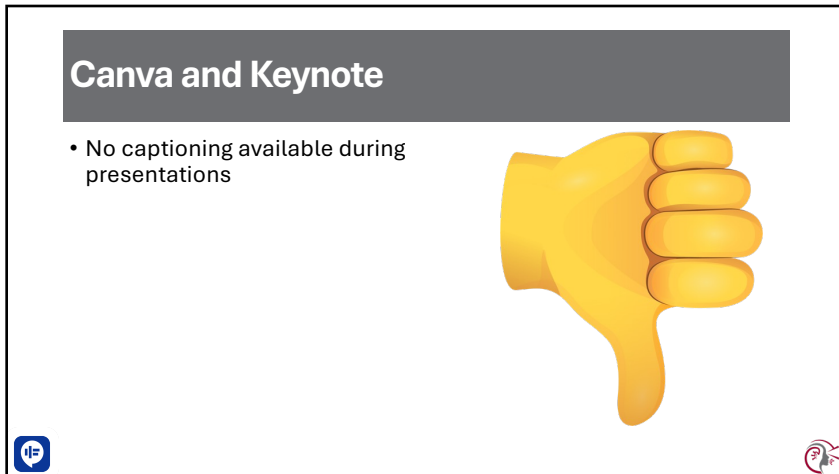




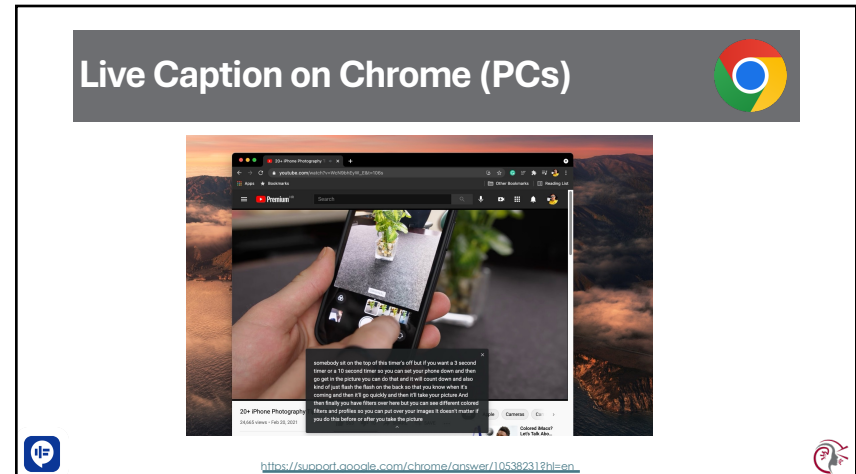
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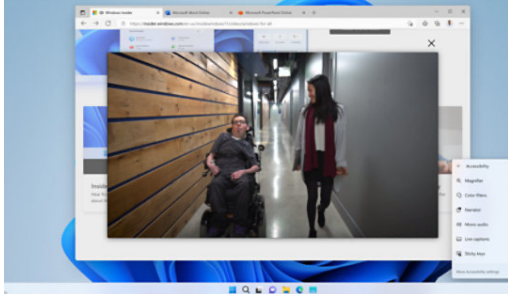
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## Live Captions on Windows

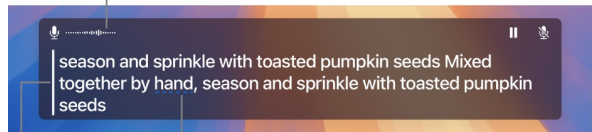


A screenshot of a Windows desktop showing a video player with live captions. The video shows a person in a wheelchair and another person walking in a hallway. The captions are displayed at the bottom of the video player. The Windows logo is in the top right corner.

<https://www.microsoft.com/en-us/windows/tips/live-captions#:~:text=Use%20live%20captions%20to%20better%20know%20key%20+%20Ctrl%20+%,&context=us>

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## Live Caption on MacBook



A screenshot of a MacBook desktop showing a video player with live captions. The video shows a person in a wheelchair and another person walking in a hallway. The captions are displayed at the bottom of the video player. The Apple logo is in the top right corner. Annotations point to specific features: a microphone icon indicates audio detection, a scroll bar indicates recent captions, and an underline indicates low confidence.

Indicates when Live Captions is detecting audio.

Scroll up to view recent captions.


An underline indicates low confidence in the accuracy of the caption.

<https://support.apple.com/guide/mac-help/get-live-captions-of-spoken-audio-mchld11fd/mac>

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## Resources

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See Hear Communication Matters  
TinaChildressAuD.com

- Blog/site with links to resources
- List of my lists
  - Apps
  - Speech-to-Text options
  - Videoconferencing options
  - ...

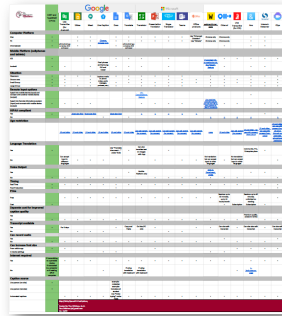


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## <http://bit.ly/SpeechToTextOptions>

- Feature grid that looks at a variety of apps and program options to access captioning
- Categorized by mobile or computer platform, cost, if it works offline and more!



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