Access Reimagined: Alternative Access for Communication, Learning, Working, and Everyday Life

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Agenda

1. Clinical Foundations for Alternative Access
2. Mobile and Tablet Access Strategies
3. Computer Access Across Functional Needs
4. Advanced Access: Head, Eye Gaze, and Switches
5. Clinical Application and Resources

Learning Objectives

01

Identify at least five alternative access methods used by individuals with brain injury.

02

Describe motor, cognitive, visual, and fatigue-related factors that influence access selection.

03

Apply person-centered principles to match alternative access methods to functional goals across daily life activities.

Why Alternative Access is Important After Brain Injury

Brain injuries can affect:

- Motor control (weakness, tremors, paralysis)
- Vision or visual processing
- Speech and language
- Cognition, attention, and fatigue
- Coordination and reaction time

(Masel & DeWitt, 2010; Rauchman et al., 2023)

Flexibility

- Because brain injury symptoms vary widely and may change over time, access methods must be flexible and customizable.
- Access needs may change daily, weekly, or during recovery.

Why Access Must be Flexible

Marcus is recovering from a traumatic brain injury after a car accident. Before his injury, using his phone and computer was automatic. During recovery, fatigue, tremor, and reduced coordination made even simple tasks like texting or selecting an app difficult. What worked one day did not always work the next, showing why alternative access after brain injury must remain flexible and individualized.

Clinical question: What changes first—movement, endurance, cognition, or all three?

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Clinical Access Screening

Which movement is reliable?
Which movement is repeatable?
Which causes least fatigue?
Which supports function over time?

Hands → Head → Mouth → Feet → Upper Extremities → Lower Extremities → Mind

(Lange, *switch assessment course content*, Access to Independence; OccupationalTherapy.com)

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Body Movements to Consider for Access

- Hand (down, up, to the side, or grasp)
- Finger (tap, squeeze, or up)
- Elbow (to the side or down)
- Head (to the side)
- Mouth (sip and/or puff and tongue)
- Chin (down or to the side)
- Eyebrow or Eye Blink
- Knee (up or to the side)
- Foot (down, up, or to the side)
- Toe (down, up, or to the side)
- Eye Tracking

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Direct Touch Support

Clinical Need	Example	Key Clinical Note
Weak grasp	NanoNob	reduces grip demand
Reduced finger isolation	Stylus	improves targeting
Fatigue/slower typing	Bluetooth keyboard	reduces touchscreen burden

Tablet and Phone Accessibility

Always trial built-in access before external hardware.

Feature	Helps With	Examples
Voice Control	Hands-free use	Apple Voice Control, Android Voice Access
Shortcuts	Faster, easier tasks	Voice assistants, widgets, favorite contacts, Focus automations
Accessibility Tools	Personalized access	Screen reading, larger text, contrast settings, captions

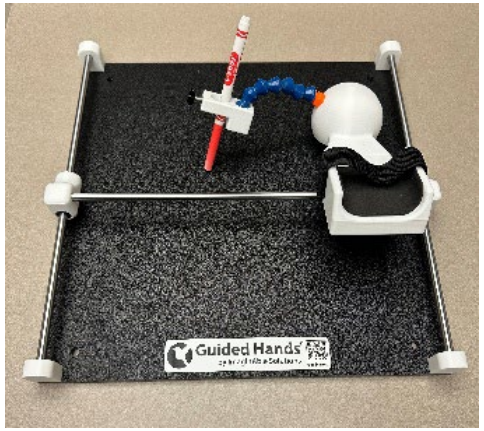
Source: Apple Accessibility / Android Accessibility

Positioning Often Determines Success

- Arm support improves precision
- Visual angle reduces fatigue
- Poor positioning increases access failure

Stabilization Changes Performance

Access Need	Product	Best For
Hand Stabilization	• Guided Hands • Steadi-3	Tremor/Ataxia
Controlled Stylus use	• Apple Pencil • Limitless Stylus	Reduced Precision
Grip Support	Eazy Hold	Weak Grasp



Keyboard Access Categories

Access Need	Access Category	Example	Clinical Consideration
Limited use of one hand	One-handed keyboard	TiPY	Supports full keyboard access when reach is limited to one side
Reduced visual accuracy	High-contrast keyboard	Black and yellow keyboard	Improves key identification and visual targeting
Cognitive or motor challenges	Simplified layout keyboard	Clevy	Larger keys and reduced visual complexity support accuracy

Keyboard Clinical Considerations

- The goal is not choosing a product first — it is identifying what makes typing possible with the least effort and greatest consistency.
- Match keyboard layout to **motor control and endurance**
- Consider **visual processing demands**
- Reduce unnecessary complexity when cognition is affected

Mouse

Need	Access Type	Clinical Fit
Reduced endurance	vertical mouse	neutral wrist
Reduced movement	trackball	stable cursor
Tremor	joystick/filtering	controlled movement

Mouse Clinical Considerations

Selection Depends on :

- Range of Motion
- Endurance
- Cursor Accuracy
- Fatigue over time

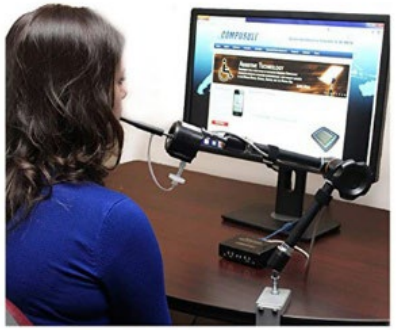
Always Assess:

- Click Accuracy
- Drag Ability
- Double Click Tolerance
- Sustained cursor control

When Hand Access Is Not Reliable

Access Method	Example	Best Functional Fit	Clinical Consideration
Head Control	GlassOuse	Reliable head movement with limited hand use	Requires consistent head control and endurance
Mouth Control	Jouse	Reliable sip, puff, or mouth movement for cursor and click control	Monitor fatigue, oral motor endurance, and positioning
Eye Gaze	Tobii	Minimal physical movement with strong visual attention	Requires visual stability, attention, and sustained gaze control

Head and Mouth Control



Clinical Thoughts

The most successful access method is not always the most advanced — it is the one the person can sustain reliably across daily tasks.

- Selection depends on **endurance, posture, and cognitive load**
- Accuracy often changes with **fatigue**
- Positioning strongly affects success

Why Eye Gaze Should Not Always be First

- Eye gaze can be **highly fatiguing**, especially for beginners
- Fatigue often appears after **15–30 minutes of continuous use**

- **Requires simultaneous:**
- visual attention
- motor planning
- sustained fixation
- cognitive effort

Research Findings

- New users often show tiredness and exhaustion during initial eye-gaze use (Borgestig et al., 2015)
- Performance improves over time, but long-term practice is required (Borgestig et al., 2015)
- Eye typing is slower because of eye fatigue and repeated dwell demands (Bafna et al., 2021; Räihä & Ovaska, 2012

Brain Injury and Eye Gaze

- Adults with traumatic brain injury demonstrate difficulty with visual search and slower scanning, which can interfere with gaze-based AAC use (Riccardi et al., 2022).
- AAC can still improve communication and cognition after acquired brain injury, but access method must match fatigue and cognitive load (Formica et al., 2024).
- Clinical reports recommend trialing simpler access methods first before committing to eye gaze when attention and fatigue fluctuate (Fager & Spellman, 2010).

Switch Access: When Small Reliable Movement Can Drive Access

Access Method	Example	Best Clinical Fit	Clinical Consideration
Hand Switch	Hand-activated switch	Reliable finger, hand, or palm activation	Requires repeatable activation with low fatigue
Chin Switch	Chin switch	Limited hand use with consistent chin movement	Positioning is critical for accurate activation
Bluetooth Switch	Blue2	Wireless access for phone, tablet, or computer	Supports scanning but requires timing control

Switches

Switch Access Clinical Thoughts

- Small movement can create full device access
- Consistency directly affects switch success
- Positioning directly affects switch success
- Successful switch use depends on choosing the movement that remains most reliable over time, not just the movement that is strongest during evaluation.

Switch Access Requires Clinical Assessment

- Reliable movement
- Timing
- Scanning Tolerance
- Endurance
- Activation Force

A switch may work perfectly in assessment but fail functionally if timing or fatigue is not considered.

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Emerging access options when traditional methods are not sufficient

Control Bionics
- Touch
- Eye Control
- EMG/Spatial Control

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Clinical Takeaways

- Start with reliable movement
- Match access to endurance
- Reduce cognitive load
- Positioning changes outcomes
- Flexibility matters over time

Funding considerations

Assistive Technology for Kansans

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Assistive Technology for Kansans: Funding and Mission

Assistive Technology for Kansans is the statewide assistive technology program funded by the **Administration for Community Living** in the Department of Health and Human Services.

ATK serves people with disabilities and health conditions of all ages across the state.

Assistive Technology for Kansans: Four Core Services

- **Device Demonstrations:** hands-on opportunity to review a range of possible device solutions and compare features with knowledgeable staff.
- **Device Loan:** Individual borrows devices for a few weeks to determine if it meets their needs. Technical assistance on use and care for devices is provided.
- **ATK-KEE Reuse:** Donated high-quality devices are refurbished and given to individuals who need them.
- **Funding:** Provide assistance to determine eligibility for public and private funding options, assist with eligibility paperwork, gather documentation, and help with appeals as needed.

Request to borrow equipment today:

www.atkloan.org

Contact your regional AT Access Site

- 785-672-3125: Western (NKESC, NW - Oakley, SW - Garden City)
- 785-827-9383: North Central (OCCK, Salina)
- 316-942-5444: South Central (SKIL, Wichita)
- 785-551-9708: Northeast (KU, Lawrence)
- 620-421-6551: Southeast (SKIL, Parsons)

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Riccardi, E., et al. (2022). *Visual attention and scanning deficits following traumatic brain injury: Implications for AAC access.* **Perspectives of the ASHA Special Interest Groups**.

Product/Accessibility Sources

- Apple Accessibility
- Google Android Accessibility
- AbleNet
- Steadiwear
- ImaginAble Solutions
- Logitech
- Kensington
- ProtoArc
- Enabling Devices
- Inclusive TLC