

Gaming and Disability Player Experience Guide

A Supplemental Guide to the Xbox Accessibility Guidelines

Version 1.0



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Introduction

The Gaming and Disability Player Experience Guide is a supplemental resource to the [Xbox Accessibility Guidelines](#). While the Xbox Accessibility Guidelines provide a prescriptive list of game accessibility best practices organized by game *area* ([XAG 101: Text display](#), [XAG 102: Contrast](#), etc.), this resource organizes common barriers to gameplay and related best practice guidelines found in the XAGs by type of disability.

This guide is intended to help game developers gain a more holistic understanding of the barriers that players with certain types of disabilities may experience when game mechanics, display, content, and other aspects of the game's design are not developed with these members of the Gaming and Disability Community in mind.

How to Use the Gaming and Disability Player Experiences Guide

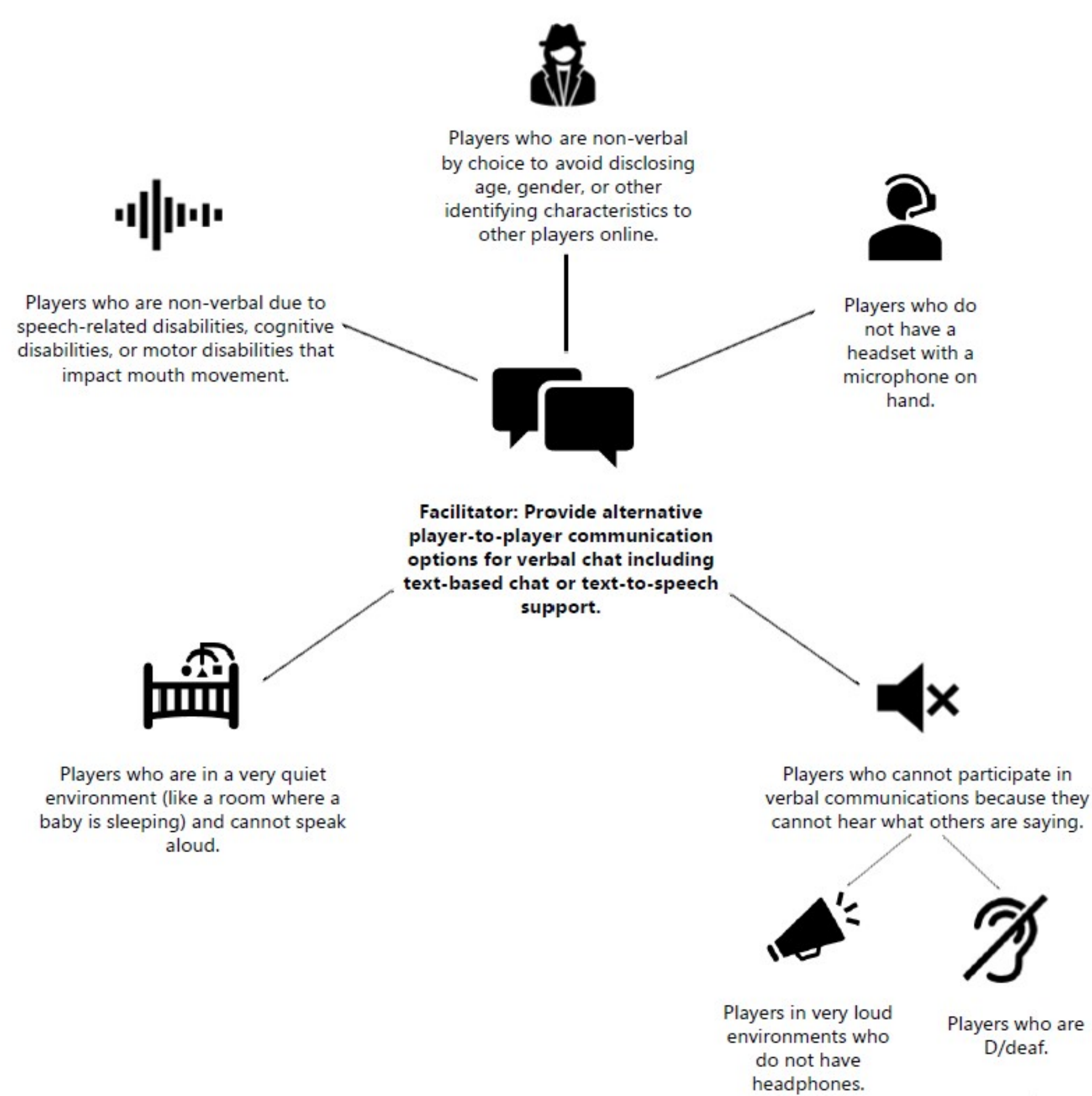
The intent of this guide is to introduce game developers to the common barriers players with disabilities may encounter while gaming, and the related best practice guidelines that work to remove those barriers. The information in this guide can be used during early planning and prioritization phases of game development to help scope accessibility goals. It can also be used as a source of foundational knowledge to help developers prepare for conversations with the Gaming and Disability Community. This guide is not intended to replace direct engagement with the Gaming and Disability Community. Every game vastly differs in terms of mechanics, design, and overall play. Subsequently, the impact on actual player experiences can vary from game to game. While this guide introduces common experiences of players with different types of disabilities, it is imperative that developers actively seek feedback and collaborate with members of the Gaming and Disability Community to validate the presence of barriers, or efficacy of facilitators presented in a specific game through User Research, play tests, and other collaboration and feedback mechanisms. Creating truly accessible experiences for more players requires working directly with gamers with disabilities to fully understand the barriers an individual game may present. Further, this direct collaboration is needed when testing the efficacy of a facilitator within the context of each individual game.

Contact Us with Feedback

The Gaming and Disability Player Experience Guide is a living document that will be updated regularly. Our team welcomes and appreciates feedback from our Gaming and Disability and Developer communities on how we can improve the information provided in this document. Please email xaccess@microsoft.com to provide feedback.

Solve for One, Extend to Many

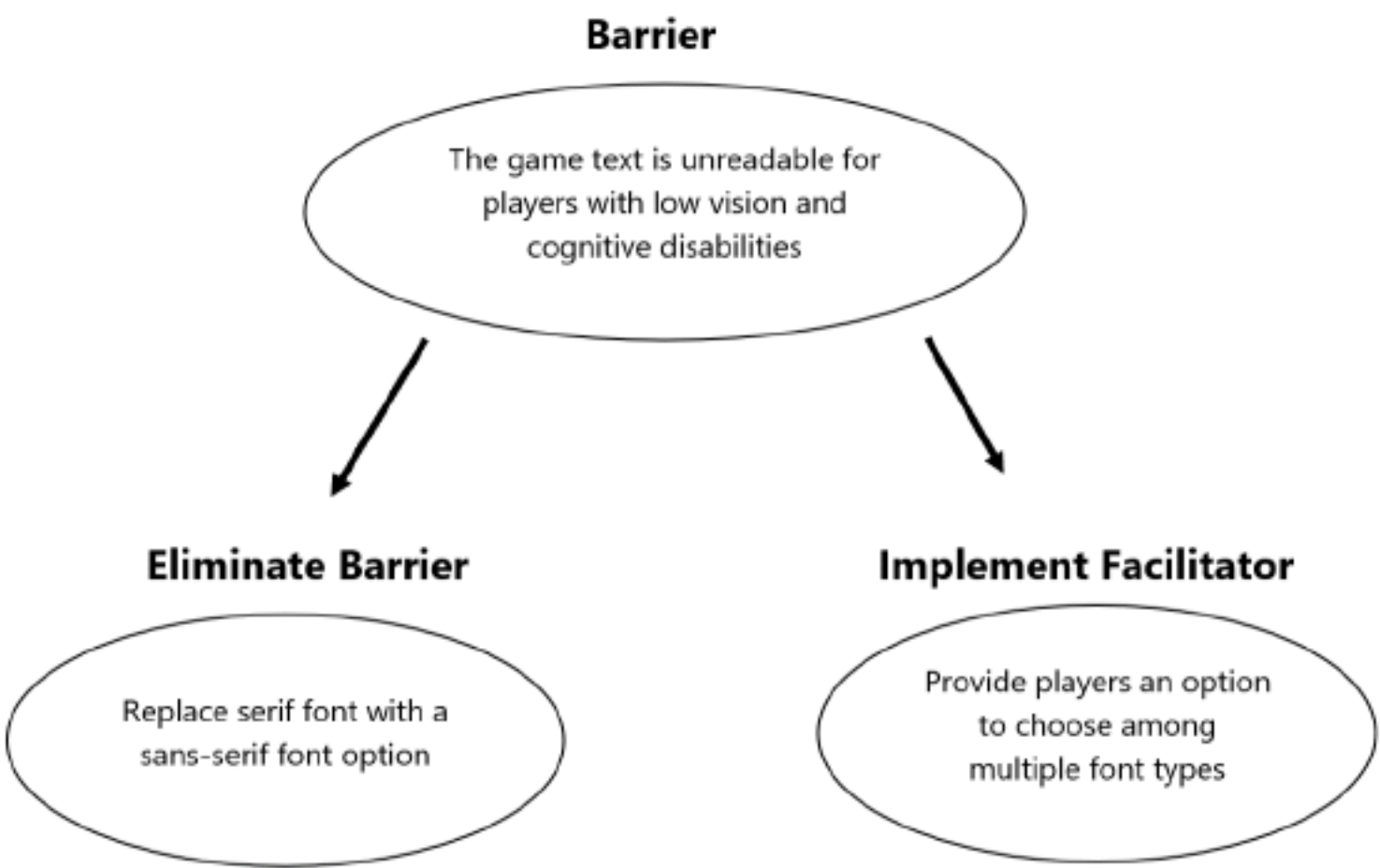
A core inclusive design principle at Microsoft is “solve for one, extend to many.” In general, this refers to the notion that inclusive design efforts built for a specific user in mind can also be beneficial for other users with differing circumstances. For example, accessible automatic doors for wheelchair access are also often used by individuals who have their hands full and cannot open the door, individuals with limited upper body strength or range of motion, or individuals who wish to avoid touching door handles due to hygienic reasons. In gaming, this means that a game option or feature intended to facilitate access for a specific group of players can often be valuable to a wide array of players beyond the intended audience. For example, while captions and subtitles are intended to make game experiences accessible to players who are D/deaf or hard of hearing, players who are easily distracted and miss audio cues, have a different native language than what is being spoken in the game’s dialogue, have learning disabilities that make auditory processing difficult, or players in a very quiet or very loud environment without headphones can all benefit from enabling subtitles and captions during their gameplay. This principle is important to highlight during early planning and prioritization phases of game development as it can provide important perspectives around the true “impact” of feature implementation across all audiences.



Introduction to Barriers and Facilitators

We all experience barriers at one point or another in our lives that can prevent us from completing a task. Barriers are typically not intentional “blockers” to our daily activities – but often occur as a result of factors beyond our control to serve another purpose. For example, you experience a road closure on your way to work as construction workers fill a dangerous pothole. This may block you from getting to your destination entirely or require you to take a lengthy alternate route.

Unlike many barriers in life, game development is unique in that it provides developers the opportunity to decide which barriers they would like to introduce in the game including difficulty levels, control schemes for game input, and more. In many cases, barriers that negatively impact players with disabilities may have been created unknowingly. For example, a developer chooses a font family with lots of curled line extensions on each letter, often referred to as a “Serif Font,” because the style aligns with the “Ancient Roman” theme of the game they are creating. While aesthetically pleasing for some, this text creates a barrier for players with low vision or cognitive disabilities who may have difficulty reading these serif fonts. If a player cannot read game text, including text in menus, in the heads-up display, in chat boxes, and more, they can be blocked from fully engaging in the game. Once barriers are identified, there are multiple approaches that can be taken to help limit experiences that block players from progressing through the game. These include removing the source of the barrier in the game altogether or providing customization options that facilitate a player’s ability to bypass the barrier.



Understanding “Barrier” and “Facilitator” Language

This guide frames accessibility around “barriers” and “facilitators.” Barriers are game mechanics or design choices that exclude or block a player from proceeding in the game. For example, a barrier would be a design choice that requires players to repeatedly hit multiple buttons to defeat enemies encountered in combat, as this can block players who are physically unable to quickly hit multiple buttons from proceeding past points in the game where an enemy is present. The barrier is not the player’s disability that makes button-mashing difficult. Rather, the barrier is caused by the functional demands placed on players by the game to be successful. In this scenario, the functional demands are the expectation that all players can quickly mash two buttons. Facilitators are design choices or options provided by the game that can either eliminate the presence of a barrier or provide a player with a way to bypass a barrier and unblock their gameplay. For example, a facilitator for the barrier described above could include providing players an option to disable or bypass quick-time-events or enable toggled assists like auto-fire.



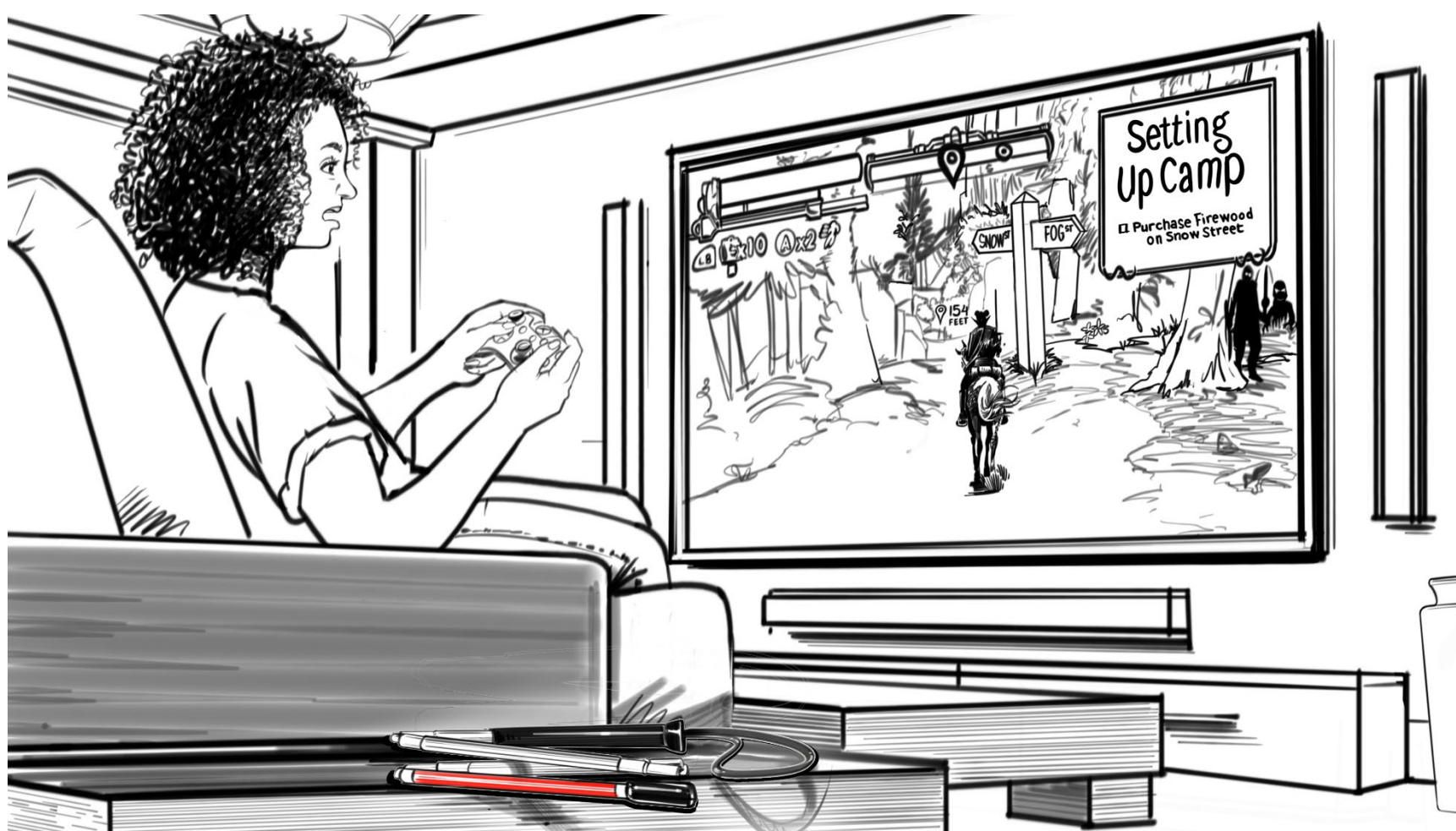
Vision and Gaming

Many game experiences are highly visual and optimized for players who can fully perceive all visual elements on the screen including menu text, chat-box text, heads-up display elements, waypoint markers, location of enemies, teammates, or objects and more. Vision is incredibly complex, however, and there is a wide array of players that can be blocked from fully participating in game experiences when visual elements are not designed with accessibility in mind.

Barriers and facilitators can differ among players with visual disabilities including:

- **Players with No Vision:** Players who cannot perceive on-screen content.
- **Players with Low Vision:** Players with varying degrees of ability to see on-screen content
- **Players with Color Vision Deficiency (Colorblindness):** Players with varying degrees of ability to discern the colors of on-screen content or distinguish certain colors from others.
- **Players with Situational and Temporary Factors Impacting Vision:** Players experiencing environmental or temporary circumstances that impact the visibility of their gameplay.

Vision and Gaming – Barriers and Facilitators in Action



Barrier: The on-screen objectives in this game inform the player that they must travel to Snow St. to purchase firewood for their camp. The representation of information like objective text, directional markers, text labels (“Snow Street”), or enemy characters solely through visual channels can block players without sight from using this information to inform their gameplay.



Facilitator: Game developers ensured that on-screen text like objectives, waypoint markers, and in-game text like “Snow Street” and “Fog Street” can be announced via narration. Additionally, the use of spatial audio can help players derive context around directionality of where text labels exist in the game relative to the player’s character.



No Vision

Players who cannot perceive on-screen content may experience barriers when visual information critical to informing gameplay is not represented by additional, non-visual sources such as audio or haptic affordances.

Players who game without sight typically leverage their other senses like hearing and touch to inform all aspects of their gameplay. If essential information or cues needed to play are only provided through visual means, players who are unable to leverage this visual information can be blocked. For example, a sighted user may see that a large group of enemies are approaching from the top right-hand side of their screen. They can either choose to prepare for battle or walk in the opposite direction to avoid combat. Players unaware of this visual information can be taken by surprise and be defeated. Portraying all visual information, including scenarios like this through other sensory channels including spatial or directional audio, game narration, audio descriptions, and distinct audio cues or haptic rumble patterns can remove the barriers associated with visual channels as the only method of perceiving key game information

Barriers

- **Portraying game information solely through text-based elements**
This applies to game elements like menus, text labels within the game environment (example: tutorials, heads-up display, street signs), text-based multiplayer communications, etc.
- **Portraying information solely through visual cues**
This applies to game elements like waypoint markers, directional cues, key game information (example: incurring damage, color, or “glow” to indicate of an interactable object), location of enemies & key objects, weapons, or interactable items.
- **Mouse-based or touch-based inputs**
Touch-based inputs refer to touch screens where a player’s finger is essentially the mouse cursor. Mouse and touch-based inputs require hand-eye coordination, while digital inputs like buttons or keyboard keys do not. Players without vision can be blocked when digital input alternatives are not supported.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation.*

- **Provide narration for all game text**
[XAG 106: Screen Narration](#)
- **Support spatial audio**
[XAG 105: Audio Customization](#)
- **Represent visual cues aurally**
[XAG 103: Additional Channels](#)
- **Represent visual cues through haptic feedback**
[XAG 103: Additional Channels](#)
- **Provide audio descriptions for full-motion videos and cutscenes**
[XAG 111: Audio Description](#)
- **Support audio customization for different classes of sound**
[XAG 105: Audio Customization](#)
- **Ensure the entire game experience is operable using digital-only inputs**
[XAG 107: Input](#)



Low Vision

Players with varying degrees of ability to see on-screen content may experience barriers when the visibility of on-screen elements like text, heads-up displays, directional cues, and more are not distinguishable.

The game experiences and barriers encountered by one player with low vision can vastly differ from the experiences of another given the wide array of visual conditions and disabilities that “low vision” encompasses. Players with low vision may see their device screens in a way that is blurrier, darker, lighter, cloudier, or with parts of their view missing or incomplete. A player with low vision may be able to perceive some content provided on-screen but can become blocked when visual elements are small, have low contrast ratios against their background, or spread widely across the screen. Facilitators like the ability to scale the size of text and in-game elements, change the color of elements and their background, or use assistive tools like magnifiers or High Contrast Modes can help unblock players.

Barriers

- **Text display (size, spacing, and font type) across all game experiences.**
This applies to game areas like menu text, in-game text (example: HUD text labels, on-screen objectives, maps, in-game tutorials), text within the game environment (example: names on a street sign, storefront, or character’s nametag/badge), incoming text-based player communications (example: party chat, chat boxes).
- **Visual Cue Size**
This applies to game elements like waypoint markers, directional cues, targeting icons.
- **Contrast Ratios of elements against their background**
This applies to game elements like waypoint markers, directional cues, key game information (example: incurring damage, color, or “glow” to indicate of an interactable object), the location of enemies, key objects, weapons, or interactable items.
- **Placement of visual elements on screen**
Players missing parts of the visual field (tunnel vision, spotty vision, etc.) may easily miss elements located in certain areas of their screen.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Support text and UI scaling**
[XAG 101: Text Display](#)
- **Provide serif and sans-serif font options**
[XAG 101: Text Display](#)
- **Meet minimum spacing guidelines**
[XAG 101: Text Display](#)
- **Support the option to apply opaque backgrounds behind text**
[XAG 102: Contrast](#)
- **Support magnification tools**
[XAG 101: Text Display](#)
- **Support color selection tools for text color, background color, and key elements**
[XAG 102: Contrast](#)
- **Provide players the option to move important UI elements like HUD placement, inventory bars, etc. to areas of the screen of their choosing**



Color Vision Deficiencies (Colorblindness)

Players with varying degrees of ability to discern the colors of elements or distinguish certain colors from others may experience barriers when important game information or elements are identified by color alone.

Barriers in gameplay for players with color vision deficiencies or colorblindness often occur when color alone is used to identify important objects or information (ex: green flowers are safe to eat, red flowers induce player damage). Additionally, certain color palettes in a game may appear to make the color of crucial elements like interactable items or targeting indicators stand out against their background for players who do not have colorblindness but can appear as muted against the rest of the game environment for players with colorblindness depending on the colors used.

There are multiple types of colorblindness that impact a player’s ability to discern the difference between colors, how bright colors are, or the shades of colors. There are 3 primary types of colorblindness: Red-Green colorblindness which is most common and can make it difficult for players to discern the difference between green and red, Blue-yellow colorblindness which is less common and can make it difficult for players to discern the difference between blue and green, and yellow and red, and complete colorblindness in which a player cannot see colors at all. Further, it is important to know that one player with red-green colorblindness may have symptoms mild enough to go unnoticed, while another player with the same type of color blindness can be more significantly impacted. Therefore, color filters that address types of colorblindness are not always the most accessible option for all players. Providing players with the ability to choose the color of essential elements is always preferred.

Barriers

- **Use of color alone for identification**
This applies to game areas like interactable objects, enemy vs ally character outline colors, map marker colors of character locations, dangerous vs useful objects (example: green flowers increase health, red flowers diminish health).
- **Color assignments of key visual cues against the background environment color**
This applies to game elements like waypoint markers, directional cues, targeting icons (example: a red targeting icon against a green, grassy background can appear muted for players with red-green colorblindness).
- **Text color versus background color**
This applies to game elements like menu text color vs menu background color, in-game text like subtitles and captions, on-screen objectives, or player-to-player communication text against its background.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide color choice options for all key game elements**
[XAG 102: Contrast](#)
- **Provide an option to enable opaque backgrounds behind text**
[XAG 102: Contrast](#)
- **Provide color choice options for text and text block backgrounds**
[XAG 102: Contrast](#)
- **If colorblind filters are provided, allow players to adjust the “intensity” of the filter**
[XAG 102: Contrast](#)
- **Support platform-level high contrast modes or provide one**
[XAG 102: Contrast](#)



Situational and Temporary Factors Impacting Vision

Players experiencing environmental factors or temporary circumstances that impact their ability to view their game screen may experience barriers when playing in conditions that cause screen glare or make visual elements more difficult to see due to the size or distance of their screen.

All players at one point or another have likely experienced situational or temporary factors that impact the visibility of game content on their screen. Environmental factors like playing in bright sunlight or bright environments like an airplane cabin during a daytime flight can create glare on screens. Similarly, when playing on smaller devices like mobile phones, text and elements must be scaled to significantly smaller sizes, making them difficult to read for some. Players may be using display-level filters on their device like Night Mode or Blue Light filters to avoid eye strain or migraines. Sometimes these filters can change the appearance of colors on their device, resulting in similar barriers faced by players with colorblindness. It is important to remember that game options and customization tools are important to all players in supporting their ability to create experiences that are accessible and enjoyable for everyone.

Situational and Temporary Factors

The following situational and temporary factors may contribute to players of all abilities experiencing barriers to gameplay

- **Screen glare that obscures content or diminishes visibility**
Playing in bright environments (example: office buildings with florescent lights or a room with lots of natural light)
Playing outdoors or in bright sunlight
- **Playing on a “small” screen that makes text and visual elements appear small**
Playing on mobile devices
Playing on screens that are far away
- **Use of screen filters that obscure colors**
Blue light filters
“Night Modes”

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Support text and UI scaling**
> [XAG 101: Text Display](#)
- **Support magnification tools**
> [XAG 101: Text Display](#)
- **Support color selection tools for text color, background color, and key elements**
> [XAG 102: Contrast](#)
- **Support platform-level high contrast modes or provide one**
> [XAG 102: Contrast](#)



Hearing and Gaming

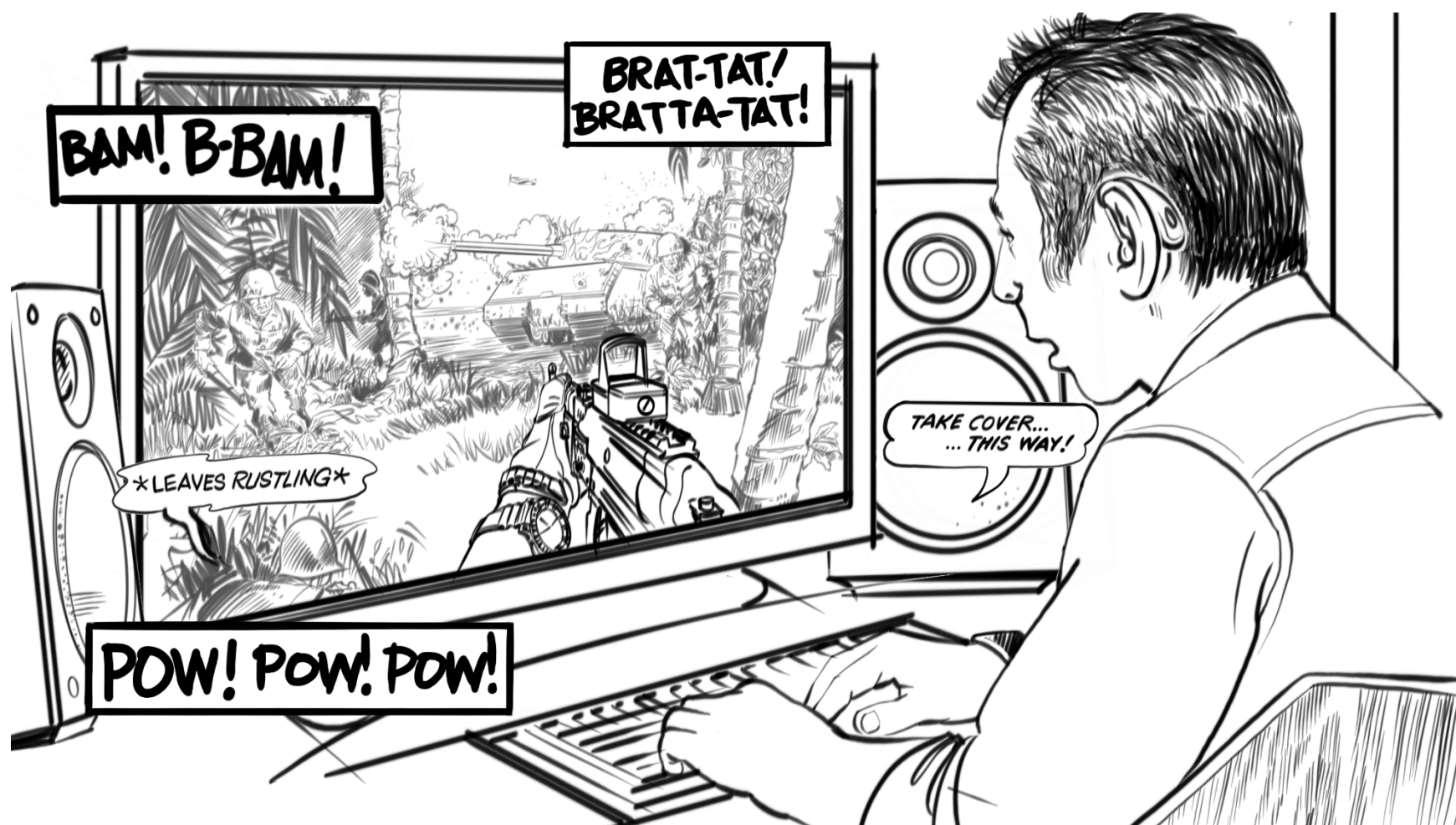
There are many audio-related game elements that provide crucial information to players. Game elements like the sound of enemy fire, the footsteps of enemy characters approaching, non-player character chatter, and even voice-based communication with other online players are heavily present in games today. For players with varying degrees of hearing loss, certain sounds may be completely audible, while others can get lost in the mix as they compete with background noises like music or sound effects.

Barriers and facilitators can differ among players with hearing disabilities including:

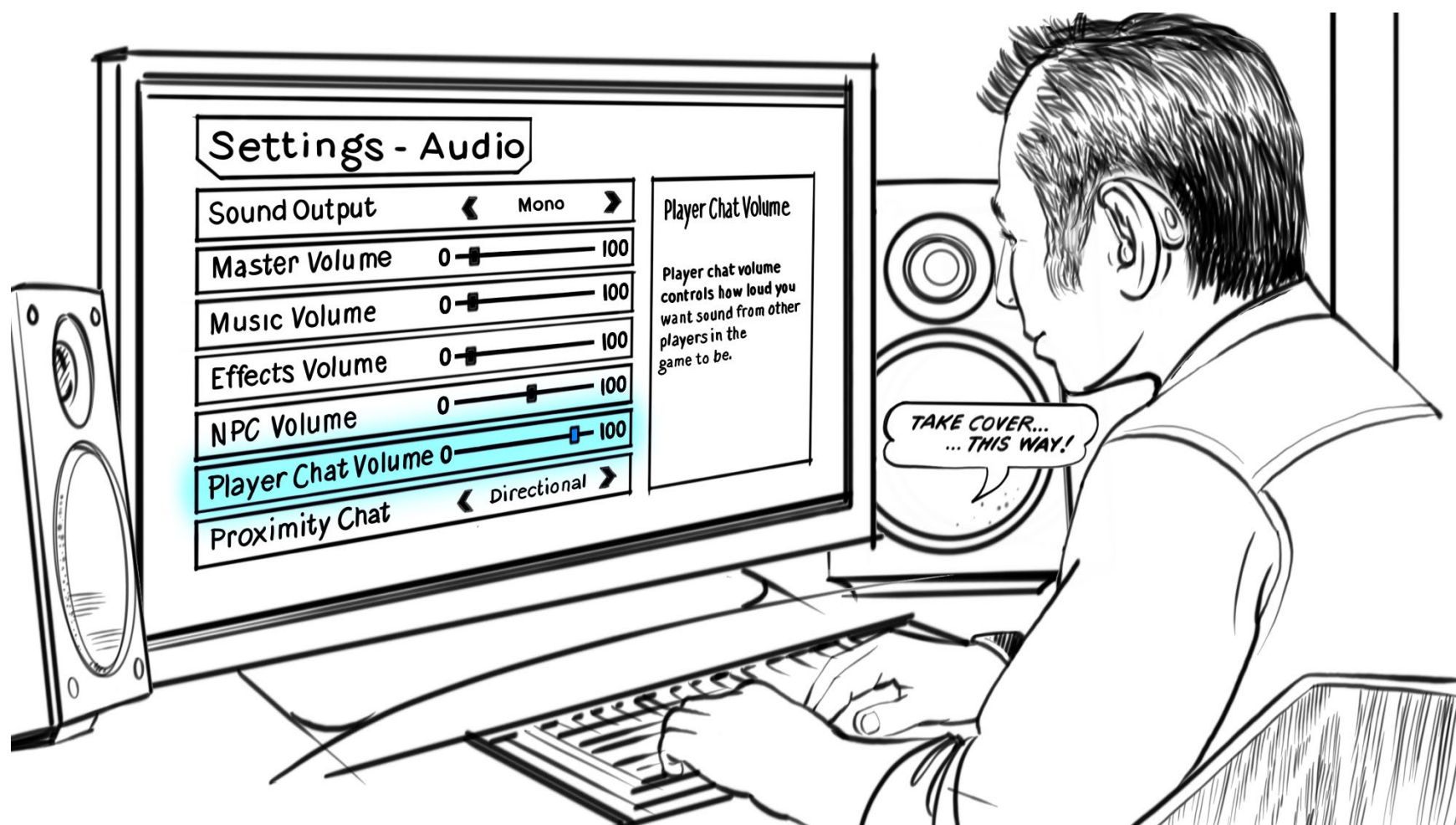
- **Players with No Hearing:** Players who cannot hear any game audio that informs gameplay.
- **Players with Limited Hearing (Hard of Hearing):** Players with varying degrees of ability to hear game audio that informs gameplay
- **Players with Asymmetrical Hearing:** Players with differing levels of ability to hear audio in one ear versus the other.
- **Players with Situational and Temporary Factors Impacting Hearing:** Players experiencing environmental or temporary circumstances that impact their ability to hear game audio.



Hearing and Gaming – Barriers and Facilitators in Action



Barrier: This game supports spatial audio output. For this player who is deaf in his right ear and wears a hearing aid in the other, game sounds being channeled through his right speaker are missed. Additionally, multiple sounds are occurring including weapons firing, explosions in the background, and other effects like the sounds of leaves rustling. As a result, the player may miss important cues from the game like a non-player character shouting “take cover, this way!” to the player to inform him where to go next.



Facilitator: The player adjusts his audio output settings from “stereo” to “mono” so all game sounds are provided through both speakers. Additionally, he individually adjusts the volume for each class of sound from the game to lower noises like effects and music volume and raise the volume of non-player character dialogue volume.



No Hearing

Players who cannot hear any game audio that informs gameplay may experience barriers when auditory information critical to informing gameplay is not represented by additional, non-aural sources such as visual cues, text labels, subtitles and captions, or haptic affordances.

Audio-based information in games can help inform players of things like enemy footsteps approaching, explosions or incoming enemy fire, important dialog spoken by characters in the game, and online speech-based multiplayer communication from other players. Audio cues like the sound one's health bar depleting, or a "ding" when an interactable object is present may seem like minor, background embellishments. However, the absence of these cues can block a player from successfully participating in gameplay. When a player is not able to perceive key information from the game because it is provided solely through auditory means, that player must navigate through gameplay without the same cues and support that other players have. When audio affordances are also represented through additional channels like vision and haptics, players who cannot hear game audio can leverage this information during gameplay.

Barriers

- **Providing cues or other essential information through audio channels alone**
This applies to game areas like key informative sounds including the presence of impending danger (example: enemy fire, footsteps, chatter), sounds related to player status (example: audio cues regarding low player health or hunger), key events (example: a "ping" when an objective is completed, or an interactive object is nearby).
- **The use of spatial audio cues alone to inform where a sound is coming from**
The use of spatial audio alone for an off-screen cue that blocks players from deriving the direction of where the cue is located.
- **Full-motion video (FMV) and cutscene dialogue that provides key game information through audio channels alone**
This applies to dialogue from non-player characters in FMVs and cutscenes that relays essential information about game objectives or storyline to the player through audio alone.
- **Player-to-player communication channels that only support speech-based input and output**
This applies to party chats and any other online voice channels.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Represent audio cues through additional channels (visual, and haptic)**
[XAG 103: Additional Channels](#)
[XAG 110: Haptic Feedback](#)
- **Support subtitles and captions for character dialogue and in-game sounds**
[XAG 104: Subtitles and Captions](#)
- **Provide directional indications of where an audio cue or dialogue is coming from**
[XAG 104: Subtitles and Captions](#)
- **Provide text-to-speech and speech-to-text transcription**
[XAG 120: Communication Experiences](#)
- **Provide player-to-player communication platforms that are not speech-based such as text-chat**
[XAG 120: Communication Experiences](#)
- **Provide full transcripts of game narration and dialogue online for player reference**
[XAG 120: Communication Experiences](#)



Limited Hearing (Hard of Hearing)

Players with varying degrees of ability to hear game audio that informs gameplay may experience barriers when various audio channels like music, sound effects, character dialogue and party chat are occurring simultaneously.

Players who are hard of hearing may experience different barriers to gameplay depending on factors like the frequency of sounds, quality of sounds, and presence of other audio occurring simultaneously that interferes with a player's ability to distinctly hear and act upon information from a specific audio cue. There are many different types of audio tracks and sounds that games present. These include background music, effects sounds, character dialogue, online player chat and more. When audio cues playing from multiple sources are competing with one another simultaneously, it can be difficult for players to hear the important sounds that are informing their gameplay. This can create barriers that prevent a player from being able to act upon those game-provided audio cues or information. For example, a game that may have atmospheric music playing, sound effects like the main character's footsteps as they walk on a loud gravel road, background noises like non-player characters talking or animals rustling nearby bushes and trees, as well as party chat audio of other players speaking. Amidst all these noises, a player may miss an important game cue like the sound of nearby enemy fire. Therefore, it's important to provide players the option to customize volumes for each type of audio track within the game. This allows players the ability to mute audio channels like background music, or other non-essential channels so key audio affordances can be heard more clearly or loudly.

Barriers

- **Playing multiple audio tracks simultaneously**
This applies to any important in-game audio tracks including music volume, sound effects, non-player character chatter volume, online party-chat volume.
- **The use of very high or very low frequency audio**
This applies to all in-game audio cues, as players with frequency-related hearing loss may miss cues of certain frequencies when they are not represented by additional means like sound captions.
- **The use of low quality or intentionally obscured audio**
This applies to game cues as well as audio tracks for non-player character dialogue such as adding intentional static and muffling for character dialogue coming through a walkie talkie.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide players the ability to customize the volume of each individual type of audio**
[XAG 105: Audio Customization](#)
- **Support subtitles and captions for all character dialogue and in-game sounds**
[XAG 104: Subtitles and Captions](#)
- **Represent audio cues through additional channels (visual, and haptic**
[XAG 103: Additional Channels](#)
[XAG 110: Haptic Feedback](#)



Asymmetrical Hearing

Players with differing levels of ability to hear game audio in one ear versus the other may experience barriers when spatial audio is used, or when gaming hardware or software for headphones does not provide an option to adjust settings for each individual ear.

Players with asymmetrical hearing may be able to hear certain sounds or audio cues from the game better in one ear than in the other ear. Players can encounter barriers when spatial or stereo audio is used in games, as this may result in a player being blocked from hearing the sounds and cues that are present on the side that their hearing loss is more severe. Increasing sound levels to make the audio cues more apparent on this side can result in audio that is too loud for their other ear. Therefore, it's important in games to provide players the option to choose between spatial or stereo audio and mono audio. Mono audio condenses directional sounds so they are all coming from the same location. All game sounds and cues will be channeled through both sides of a headset equally, as opposed to the player missing sounds and cues that are only channeled through the side of their headphones where they have difficulty hearing.

Barriers

- **The use of spatial or stereo audio alone to inform players about the direction a sound is coming from**

This applies to the use of spatial audio for game sounds, cues, etc. for off-screen elements such as the sound of explosions in the distance that can be heard and located via spatial audio but are not visually displayed on screen because they are out of the character's field of view.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide an option to toggle mono audio on and off**
[XAG 105: Audio Customization](#)
- **Provide an option to enable subtitles and captions**
[XAG 104: Subtitles and Captions](#)



Situational and Temporary Factors Impacting Hearing

Players with environmental factors or under temporary circumstances that impact the player’s ability to hear audio cues or affordances in the game. Players may experience barriers when they are playing in loud environments or when they must lower their game volume to avoid disrupting quiet environments like a room where a baby is sleeping.

There are many different circumstances and environments that players may find themselves in that limit their ability to hear audio from their game. These can include environmental circumstances like playing during a busy bus commute to work and not having access to headphones. Conversely, a player may be in a very quiet environment, like a room with a sleeping baby. In both scenarios, a player may wish to turn on subtitles and captions for audio cue information or leverage non-speech-based online communications like text chat, or text-to-speech and speech-to-text. Players may also be experiencing temporary disabilities that impact hearing such as tinnitus, a temporary ringing in the ears due to an underlying condition and would benefit from using methods other than audio channels for important game information or communication from other players.

Situational and Temporary Factors

The following situational and temporary factors may contribute to players of all abilities experiencing barriers to gameplay

- **Loud or busy environments**
Players may be unable to hear game audio over the loud environment or speak audibly over voice channels due to background noise.
- **Lack of access to headphones**
Players in environments where game audio cannot be turned on, such as a public bus, who do not have access to headphones will be blocked from leveraging game audio.
- **Lack of access to a headset with a microphone**
Players who do not own a headset with a microphone will be unable to respond to voice chat all environments.
- **Extremely quiet environments**
Players in environments where game audio or talking would be harmful, such as a room where a baby is sleeping, can prevent players from being able to leverage audio or communicate via voice channels.
- **Temporary hearing loss or hearing obstructions**
Players with temporary hearing conditions like Tinnitus, or those who have recently had an ear infection or head injury may have difficulty hearing game audio.

Facilitators

* Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation

- **Represent audio cues through additional channels (aural, visual, and haptic)**
[XAG 103: Additional Channels](#)
[XAG 110: Haptic Feedback](#)
- **Support subtitles and captions for character dialogue and in-game sounds**
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[XAG 120: Communication Experiences](#)



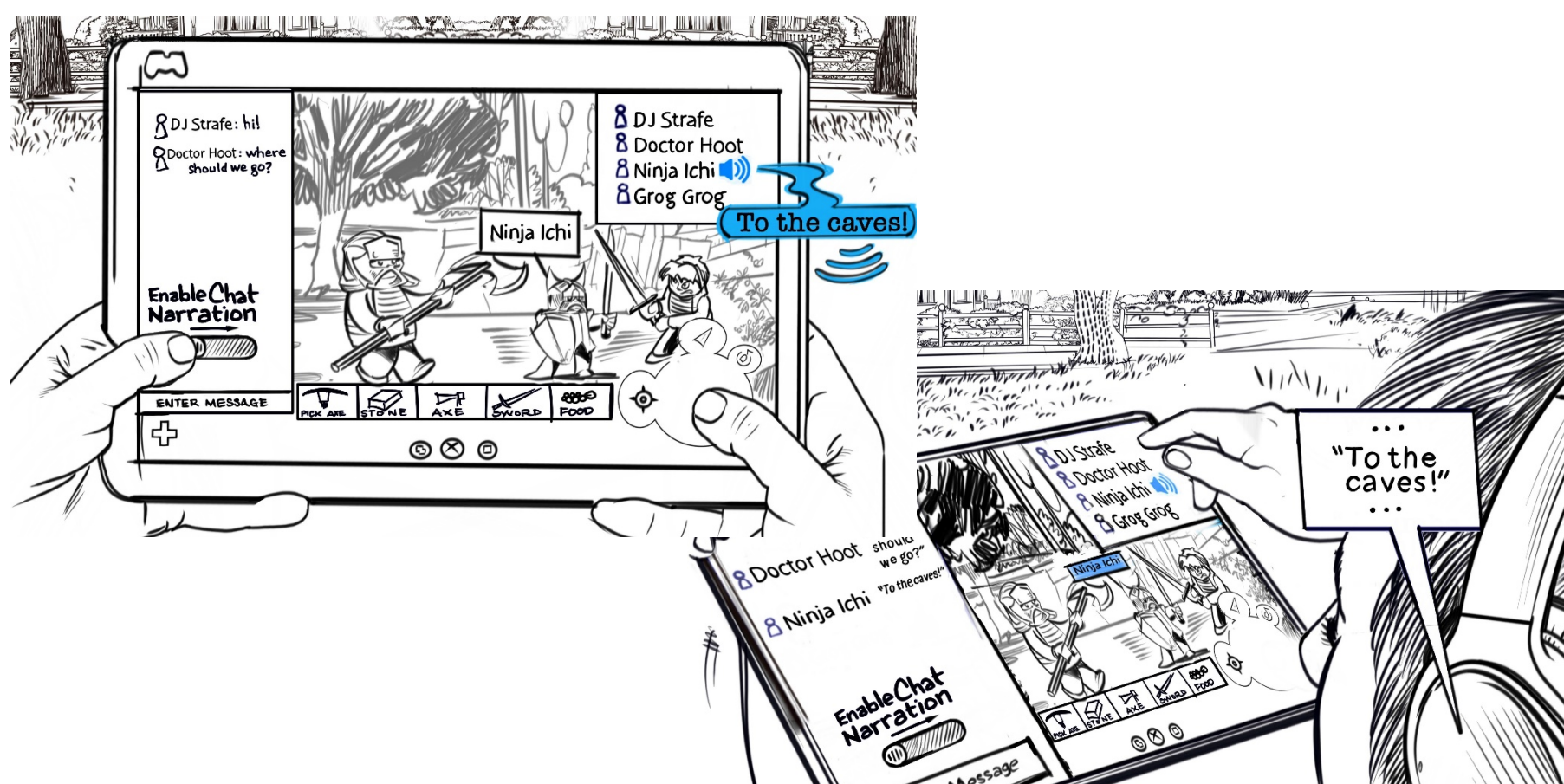
Speech, Communication, and Gaming

Gaming has been widely recognized as an enjoyable and engaging activity that fosters social connectivity and a sense of community for millions of players. Building these social connections through online multiplayer experiences is heavily reliant on access to player- to-player communication platforms like voice chat and text chat channels. This access can be especially important for members of the disability community who have limited opportunities for in-person social interaction due to limited mobility, transportation options, compromised immune systems, and more. Given this, it is incredibly important that all player-to-player communications are accessible to as many players as possible.

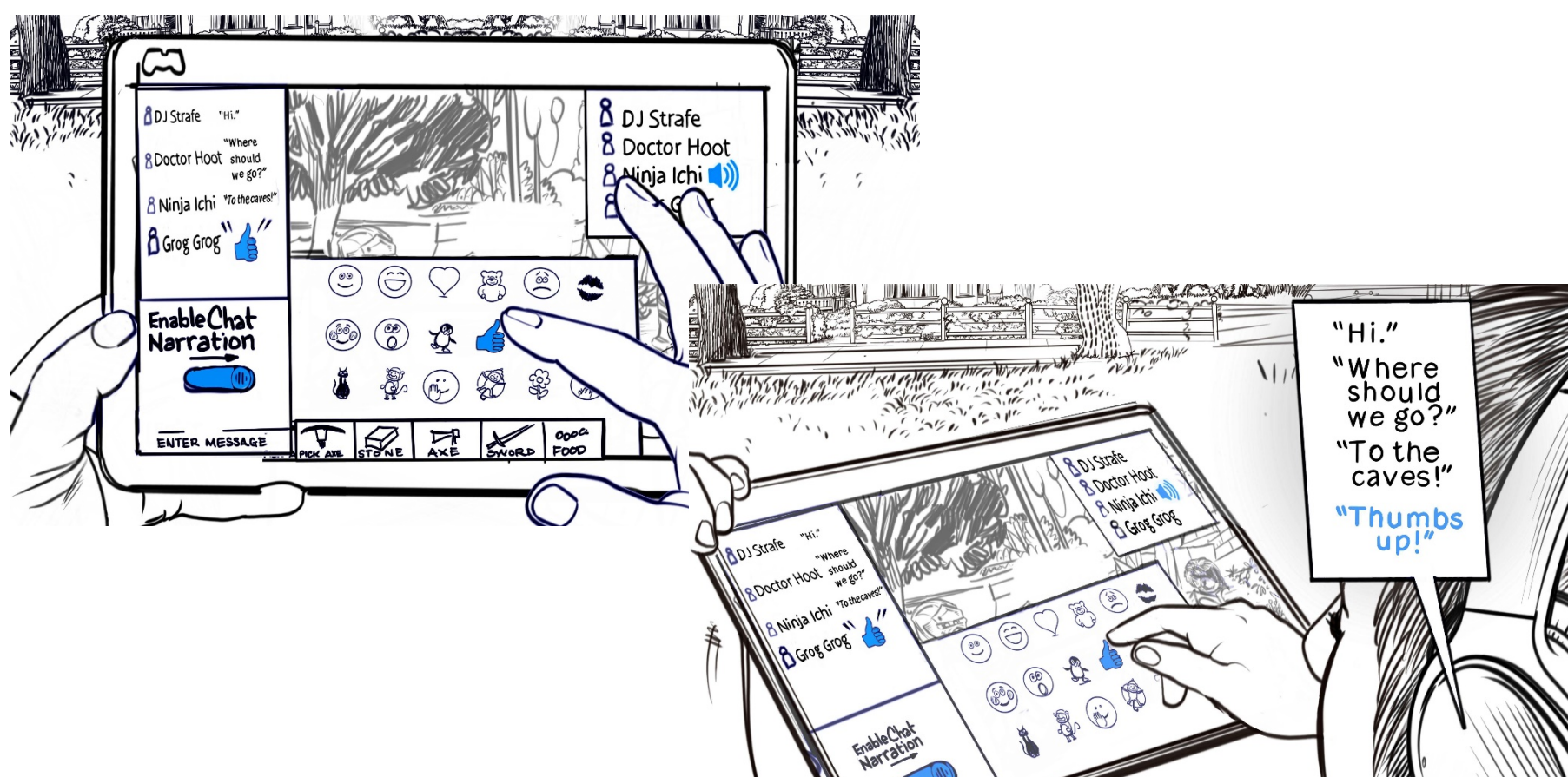
Barriers and facilitators can differ among players with disabilities that impact speech and communication including:

- **Players who are Non-Verbal:** Players who do not communicate through verbal speech due to a disability or by choice.
- **Players with Limited Communication:** Players with limited ability to communicate with other online players through speech or text-based platforms.
- **Players with Situational and Temporary Factors Impacting Speech and Communication:** Players experiencing environmental or temporary circumstances that impact their ability to use communication features.

Speech, Communication, and Gaming – Barriers and Facilitators in Action



Barrier: This player is on the autism spectrum and only uses non-verbal communication. He is playing a multiplayer strategy game with his friends. The game allows players to communicate through text chat and voice channels. The player cannot read; therefore, he does not know what his friends are saying in the text-chat or type a response to reply. He can hear his friends speaking aloud but cannot speak back to them as he is non-verbal. The player is unsure what is going on in the game.



Facilitator: The game provides an option to have text-chats from other players narrated aloud. The player can now "hear" what players are saying in text chat. Additionally, the game supports the use of symbols like emojis. This allows the player to communicate back to his friends without the need to type words or speak aloud.

Non-Verbal

Players who do not communicate through verbal speech due to a disability or by choice. Players may experience barriers when alternative forms of communicating with other online players such as text chat, text to speech, etc. are not provided.

Many players may prefer to communicate through voice chat to avoid any disruption in gameplay that can occur when taking time to type out chat-based messages. Players who do not communicate verbally can often be excluded or even removed from multi-player servers in a game if other players in the server view their “silence” negatively or as a lack of participation in live gameplay. However, it is important to note that if a player cannot physically produce speech, this does not always mean that they cannot understand what is spoken to them by others or provide a meaningful response via alternate communication channels like text. There are many reasons a player may not use verbal communications while gaming including hearing disabilities, cognitive disabilities, or disabilities that affect the physical motor coordination of muscles in the mouth, tongue, and diaphragm needed to produce speech. Some players may choose to not communicate through speech as a personal preference to hide personal information like gender or age. Players should be provided an alternate means of communicating that is not gated by the ability to produce verbal speech like text-based communication, text-to-speech transcription support, or pre-determined multiplayer game servers that advise participating players that verbal-communication is not the primary preferred method of communication for the associated server.

Barriers

- **Player-to-player communication channels that only support speech-based input and output**
This applies to party chats and any other online voice channels.
- **Sound-based or speech-recognition based inputs**
Games that require voice inputs to activate controls (example: saying the word “fire” to shoot a weapon, singing into a microphone). Games that require verbal responses to non-player characters.
- **Lack of options for non-verbal players to communicate with other online players about their communication preferences**
Example: A game only supports voice communication. A non-verbal player is kicked from the online multiplayer server because they are not “responding” to the other players.

Facilitators

* Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation

- **Support text-based and symbol-based (emojis & emotes) player-to-player communication options**
[XAG 120: Communication Experiences](#)
- **Support text-to-speech transcription**
[XAG 120: Communication Experiences](#)
- **Support digital input controls across the entire game experience that can be used in place of speech-based, or voice-recognition-based inputs**
[XAG 107: Input](#)
- **Provide an option that lets players search through game servers or matchmaking lobbies by communication preference type.**
[Game Accessibility Guidelines – Halo Reach Chattiness Preferences](#)
- **Provide player-to-player communication platforms that are not speech-based such as text chat**
[XAG 120: Communication Experiences](#)

Limited Communication

Players with limited ability to communicate with other online players through speech or text-based platforms. Players may experience barriers when communication methods are limited to speaking and text input alone.

Players with limited communication may use short, simple verbal responses on voice chat channels due to cognitive or mobility-related disabilities that make speech difficult, tiresome, or unclear. Players speaking with unclear or limited speech may face similar experiences of exclusion as players who are non-verbal in terms of being removed from live multiplayer game servers for a lack of “participation” in voice channels. Additionally, text-based communications that require typing messages into a chat box can be difficult given the cognitive demands of writing and mobility demands of “typing.” Providing alternate methods of communication like symbol-based chat (emojis or emotes), or pre-written message options (Chat wheels), can help support players with limited communication in participating in communication channels.

Barriers

- **Player-to-player communication channels that only support speech-based input and output**
This applies to party chats and any other online voice channels.
- **Text-based player-to-player communication methods that require free-form text input from the player**
This applies to text chat in games that provide players with an on-screen keyboard to type messages, but no other communication supports like quick-chat options, emojis, emotes, etc.
- **Sound-based or speech-recognition based inputs**
This applies to games that require voice inputs to activate controls (example: saying the word “fire” to shoot a weapon, singing into a microphone).
This also applies to games that require verbal responses to non-player characters.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Support text-based and symbol-based (emojis & emotes) player-to-player communication options**
[XAG 120: Communication Experiences](#)
- **Provide pre-written communication options such as chat wheels or a “quick reply” options list**
[XAG 120: Communication Experiences](#)
- **Support text-to-speech transcription**
[XAG 120: Communication Experiences](#)
- **Support digital input controls across the entire game experience that can be used in place of speech-based, or voice-recognition-based inputs**
[XAG 107: Input](#)
- **Provide an option that lets players search through game servers or matchmaking lobbies by communication preference type.**
[Game Accessibility Guidelines – Halo Reach Chattiness Preferences](#)
- **Provide player-to-player communication platforms that are not speech-based such as text chat**
[XAG 120: Communication Experiences](#)

Situational and Temporary Factors Impacting Communication

Players with environmental factors or under temporary circumstances that impact the player’s ability to participate in player-to-player communications. Players may experience barriers when they are in environments that make hearing speech from other players or speaking to other players difficult.

There are many different environmental or situational circumstances that can impact a player’s ability to communicate with others during gameplay. One of these circumstances includes any situation where a player cannot hear what others in the game are saying such as being in a loud environment without headphones. If a player cannot hear what other players are saying, they will not know how to respond or participate. Conversely, a player may be in a quiet room where a baby is sleeping. They can hear what others in the game are saying aloud through their headphones but cannot speak back to their party as they must maintain the quietness in the room. In both scenarios, supporting text-based chats, speech-to-text, and text-to-speech would help facilitate communication. In terms of chat-based communication, younger players who may not be able to read or write, or players with a different first- language than what is being used during gameplay can be blocked from participating in text-based communication. In these situations, supporting screen narration of chat messages as well as speech-to- text options can help facilitate communication.

Situational and Temporary Factors

The following situational and temporary factors may contribute to players of all abilities experiencing barriers to gameplay

- **Very loud environments**
Players may be unable to hear speech communication from other players if their gameplay environment is loud and they do not have headphones.
- **Very quiet environments**
Players in a quiet environment like a room where a baby is sleeping may be unable to communicate through speech.
- **Lack of access to a headset**
Players who do not have access to a headset or microphone may be unable to respond to other players through voice channels.
- **Player age**
Younger players who are not yet able to read can be blocked from participating in text-based communications.
- **Language barriers**
Players with a native language different than what is being spoken, typed, or transcribed by other players in the game.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Support voice-based and text-based communication channels**
[XAG 120: Communication Experiences](#)
- **Support symbol-based communications like emojis and emotes, and pre-written communication options such as chat wheels or a “quick reply” options list**
[XAG 120: Communication Experiences](#)
- **Support speech-to-text and text-to-speech transcription**
[XAG 120: Communication Experiences](#)
- **Support digital input controls across the entire game experience that can be used in place of speech-based, or voice-recognition-based inputs**
[XAG 107: Input](#)
- **Provide an option that lets players search through game servers or matchmaking lobbies by communication preference type**
[Game Accessibility Guidelines – Halo Reach Chattiness Preferences](#)
- **Support screen narration of incoming text-based communications**
[XAG 106: Screen Narration](#)
[XAG 120: Communication Experiences](#)



Cognition and Gaming

Despite how fun and engaging games can be, there is a multitude of cognitive “work” players must be do as they navigate a game that is often subconscious. This “work” often involves constantly processing information from the game to actively problem-solve and make decisions that impact the outcome of their gameplay. However, players with disabilities that affect learning, cognitive processing speeds, attention, and memory, can experience barriers when games do not provide adequate information or tools that assist in this decision making or problem solving. It is important to provide features and tools that can unblock players who require additional time, cues, or other key game information to prevent players from becoming blocked altogether.

Barriers and facilitators can differ among players with cognitive disabilities including:

- **Players with Learning and Cognitive Processing Disabilities:** Players with varying degrees of ability to understand and learn information, problem-solve, or make judgment calls.
- **Players with Disabilities that Impact Attention:** Players who are more easily distracted by stimuli or have difficulties attending to a task for extended periods of time.
- **Players with Disabilities that Impact Memory:** Players with limited ability to store and recall game information.
- **Situational and Temporary Factors Impacting Cognition:** Players experiencing environmental or temporary circumstances that impact their ability to learn and use information provided by the game.



Cognition and Gaming – Barriers and Facilitators in Action



Barrier: Some players may be easily distracted, especially when in busy environments like a transit bus. A lengthy tutorial text block appeared on this player's screen but has "timed out" and disappeared before she was able to refocus her attention to it. She is now unsure what the tutorial said, or what to do next in the game.



Facilitator: In this scenario, the tutorial instructions are no longer a long block of text. Instead, the tutorial information is concise, clear, and leverages symbols and pictures to accommodate a wide range of literacy skills. Additionally, the player is provided with a "Press B to close" prompt. The tutorial information stays on screen until she presses B when she is done reading it.



Learning and Cognitive Processing

Players with varying degrees of ability to understand and learn information, problem-solve, or make judgment calls. Players may experience barriers when game cues, mechanics, game instructions, and text-based information are complex or unclear, or provide a limited amount of time to complete tasks.

Games vary across a wide range of complexities and difficulties. As a player navigates through a game, they make decisions on where to go next, which weapons to equip, and other strategic problem-solving actions. These decisions are largely informed by information they receive from the game such as objectives, tutorials, instructional cues via non-player character dialogue or visual and audio cues. When this information is provided in a way that uses complex language, unclear or inconsistent cuing, or cannot be reviewed by the player at a later time, players across wide cognitive, literacy, language, and learning abilities may have difficulty understanding and using this information to guide their gameplay. In addition to the content itself, the amount of time that players are given to read, process, and act upon information provided is equally important. Some players may benefit from additional time to digest, understand, and act upon information and can be blocked when game elements like tutorials, objectives, or other methods of informing the player disappear after an allotted amount of time. It is important to ensure that all text-based information including those in menus, tutorials, objectives, and more are not only presented in a way that is clear and easy to interpret for players across a wide range of cognitive and learning skills but can also be referenced at any point in the game.

Barriers

- **The use of advanced or complex language to present information**
This applies to text in menu/setting selection screens as well as text provided in tutorials, objectives, non-player character dialogue, etc.
- **The presence of time limits for completing tasks or reading on-screen text**
This applies to instructions, cues, or dialogue that disappear automatically after a pre-determined amount of time.
This also applies to game events where a player must interpret instructions, then complete a task within a specific amount of time.
- **Lack of corrective feedback provided by the game**
This applies to games that do not inform players when actions are performed incorrectly. (Example: A player had to complete a series of puzzles throughout the game to unlock a door later in the game. They accidentally left one puzzle incorrect, resulting in the final door not opening. The player had no idea they had solved one of the puzzles incorrectly. They have circled back to many locations but cannot determine why they are blocked from progress.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Present information in a clear, concise manner that accommodates a wide range of language and literacy skills**
[XAG 123: Advanced Best Practices](#)
- **Portray information through multiple methods to supplement text (symbols/glyphs, audio description, images)**
[XAG 103: Additional Channels for Visual and Audio Cues](#)
- **Adequately label menu and in-game elements**
[XAG 114: UI Context](#)
- **Allow players to dismiss tutorials or dialogue via button prompts or easily extend time limits**
[XAG 116: Time Limits](#)
- **Allow players to reference control schemes, objectives, “glossaries,” or key terms and items at any time**
[XAG 109: Objective Clarity](#)
- **Provide an option to enable waypoint markers, directional cues, and/or automatic cues and hints when the game senses that the player is stuck**
[XAG 109: Objective Clarity](#)



Attention

Players who are more easily distracted by stimuli or have difficulties attending to a task for extended periods of time. Players may experience barriers when notifications, sounds, alerts, or other stimuli presented by the game, or their environment cannot be disabled.

Maintaining undivided attention while gaming is often crucial to play, as missing cues, instructions, or incoming attacks from enemy characters can put players at a large disadvantage. Some players may be more easily distracted or taken off course by environmental factors like someone walking into the room, loud noises outside, a notification going off on their phone, etc. Though it is not possible for game developers to account for a player's physical environment, there are settings and options that developers can implement that decrease the amount of distracting content provided by the game. Allowing players to adjust how often they receive notifications regarding in-game events like player invites, optional objective quests, score updates and even sounds or visual effects that are ancillary to gameplay can allow players with limited attention to customize their experience, so distractions are minimal. The ability to review any objectives or key information can help ensure that players can go back and read information they may have missed while focused on another element of the game. Additionally, features like pausing at any time and auto-save features can be an important for players who may have become preoccupied by an environmental distraction.

Barriers

- **The presence of notifications or pop-ups during gameplay**
This applies to player invitations, notifications of friends coming online, score updates, reminders, or objective cues.
- **The presence of audio distractions**
This applies to background music, effects, or audio cues that are not crucial to gameplay.
- **The presence of visual distractions**
This applies to background movement behind text, moving or "busy" backgrounds in game-play scenarios (example: bright colors, moving objects).
- **The presence of time limits for completing tasks or reading on-screen text**
This applies to instructions, cues, or dialogue that disappear automatically after a pre-determined amount of time.
This also applies to game events where a player must interpret instructions, then complete a task within a specific amount of time.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Allow players to adjust notification frequency and timing**
[XAG 116: Time Limits](#)
- **Provide players the ability to customize the volume of audio channels independently of one another**
[XAG 105: Audio Customization](#)
- **Consider providing "high contrast" modes that mute non-essential background colors and elements**
[XAG 102: Contrast](#)
- **Allow players to self-initiate dismissing objectives, cues, or dialogue or provide an ability to easily extend time limits**
[XAG 116: Time Limits](#)
- **Allow the player to reference control schemes, objectives, "glossaries" or key terms and items at any time**
[XAG 109: Objective Clarity](#)



Memory

Players with limited ability to store and recall game information. Players may experience barriers when in-game reference guides like control schemes, game objectives and tasks, and summaries of the game’s storyline or narrative are not provided.

Every day we are subconsciously, but actively using our memory to carry out basic tasks like which cabinet our coffee mugs are in, what time our first meeting is, and the route we take when driving to work. While gaming, players must actively remember things like button assignments on their controller. Otherwise, they may press “reload” when an enemy appears instead of the “shoot” button. Additionally, for games with complex narratives or storylines, a player may need to remember what has happened in the game so far, what recent key events occurred, and any instructions or cues provided by non-player characters or in-game tutorials that inform the player what to do next. For players with cognitive disabilities that impact memorizing or recalling information, barriers can occur when key information must be recalled from memory alone. This can also include game “challenges” like solving puzzles that require pattern memorization. Instead, it is important to ensure that information like control schemes, storylines, tasks and objectives, current progress and more is clearly documented in an accessible location in the game that players can refer to at any time.

Barriers

- **Relaying crucial gameplay information through character dialogues, cutscenes, or narratives that cannot be referenced at a later time**

This applies to any information on how to complete an objective or the location of an important item (example: During a conversation with a non-player character, they instruct you on where a key object is located within the game and how to use the object to complete your next task. These instructions must then be remembered until task completion).

- **Games with multiple objectives, tasks, and side-quests**

Major objectives that take hours of gameplay to complete.

Sub-tasks or objectives that must be completed to finish the overall objective.

- **Game objectives that require pre-requisites to complete tasks**

This applies to game scenarios where specific tasks must be completed before progressing through an objective (example: “collect 4/4 keys to unlock the door”).

This also applies to tasks that require pattern memorization or other specific information to complete tasks.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Allow players to revisit the game’s narrative such as replaying cutscenes or reading a summary of the narrative**
[XAG 109: Objective Clarity](#)
- **Provide options to enable waypoint markers, directional cues, hints, or other directional reminders**
[XAG 109: Objective Clarity](#)
- **Allow players to review tasks, objectives, and in-game tutorial instructions at any given time**
[XAG 109: Objective Clarity](#)
- **Allow players to review progress made at any point in time**
[XAG 109: Objective Clarity](#)
- **Allow players to review controller mappings and button assignments at any time**



Situational and Temporary Factors Impacting Cognition

Players with environmental factors or under temporary circumstances that affect cognition, learning, attention, or memory such as feeling tired, anxious, or “cloudy” thinking after a difficult day. Younger players who are still developing their cognition, problem solving skills, and reading abilities may also experience barriers.

Cognition, attention, and memory can easily be affected by situational or temporary circumstances. For example, gaming in extremely loud and busy environments like kids jumping on nearby couches or rough housing with siblings can make it difficult for any player to maintain attention for extended periods of time. Similarly, players who have had a hectic day, are feeling anxious, or are tired may have more difficulty than usual reading long blocks of text instructions in a game or remembering where they last left off. Casual gamers who only play infrequently may also benefit from the ability to review control schemes, tasks, objectives, and storylines as they may have not played a particular game in weeks or months. Providing options and supports to lessen the complexity of things a player needs to learn, attend to, and remember can be helpful for all players.

Situational and Temporary Factors

The following situational and temporary factors may contribute to players of all abilities experiencing barriers to gameplay

- **Distracting environments**
This includes noises, visuals, and other factors that can detract a player’s attention and result in missing important game information.
- **Frequency of gameplay**
Players who only re-visit a game every couple of weeks or months may have a more difficult time remembering important information.
- **Player age**
Younger players with lower levels of reading, cognitive, and problem-solving skills may also experience difficulties with understanding complex language or the memorization of crucial game information.
- **Emotional or psychological factors**
Feeling anxious, tired, or overwhelmed can impact cognitive processing, problem solving, and the ability to remember information.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Present information in a clear, concise manner that accommodates a wide range of language and literacy skills**
[XAG 123: Advanced Best Practices](#)
- **Portray information through multiple methods to supplement text (symbols/glyphs, audio description, images)**
[XAG 103: Additional Channels for Visual and Audio Cues](#)
- **Allow players to revisit the game’s narrative such as replaying cutscenes or reading a summary of the narrative**
[XAG 109: Objective Clarity](#)
- **Provide options to enable waypoint markers, directional cues, hints, or other directional reminders**
[XAG 109: Objective Clarity](#)
- **Allow players to review tasks, objectives, controller mappings, and in-game tutorial instructions at any given time**
[XAG 109: Objective Clarity](#)
- **Allow players to review progress made at any point in time**
[XAG 109: Objective Clarity](#)
- **Adequately label menu and in-game elements**
[XAG 114: UI Context](#)
- **Allow players to dismiss tutorials or dialogue via button prompts or easily extend time limits**
[XAG 116: Time Limits](#)



Mobility and Gaming

Most commercial game experiences today require some level of physical input or activation to set up games and play through them. For players with limited mobility, the need to operate mice and joysticks with smooth finessed motion or activate a multitude of small buttons repeatedly to play can be a major barrier. Some players with limited mobility may use standard controllers with only minor adaptations to button assignments or placements, while other players use assistive technologies like an eye tracking bar, or a mouth-only operated controller. There is a growing amount of interest and innovation in the adaptive hardware space today that has led to a large spectrum of input options for players with limited mobility. While adaptive hardware options are fantastic tools to help facilitate gameplay, these players can often still encounter additional barriers presented by a game’s difficulty settings, mechanics, and complex control schemes. It is important that developers are aware of the types of barriers that players across a wide range of mobility levels may encounter.

Barriers and facilitators can differ among players with mobility-related disabilities including:

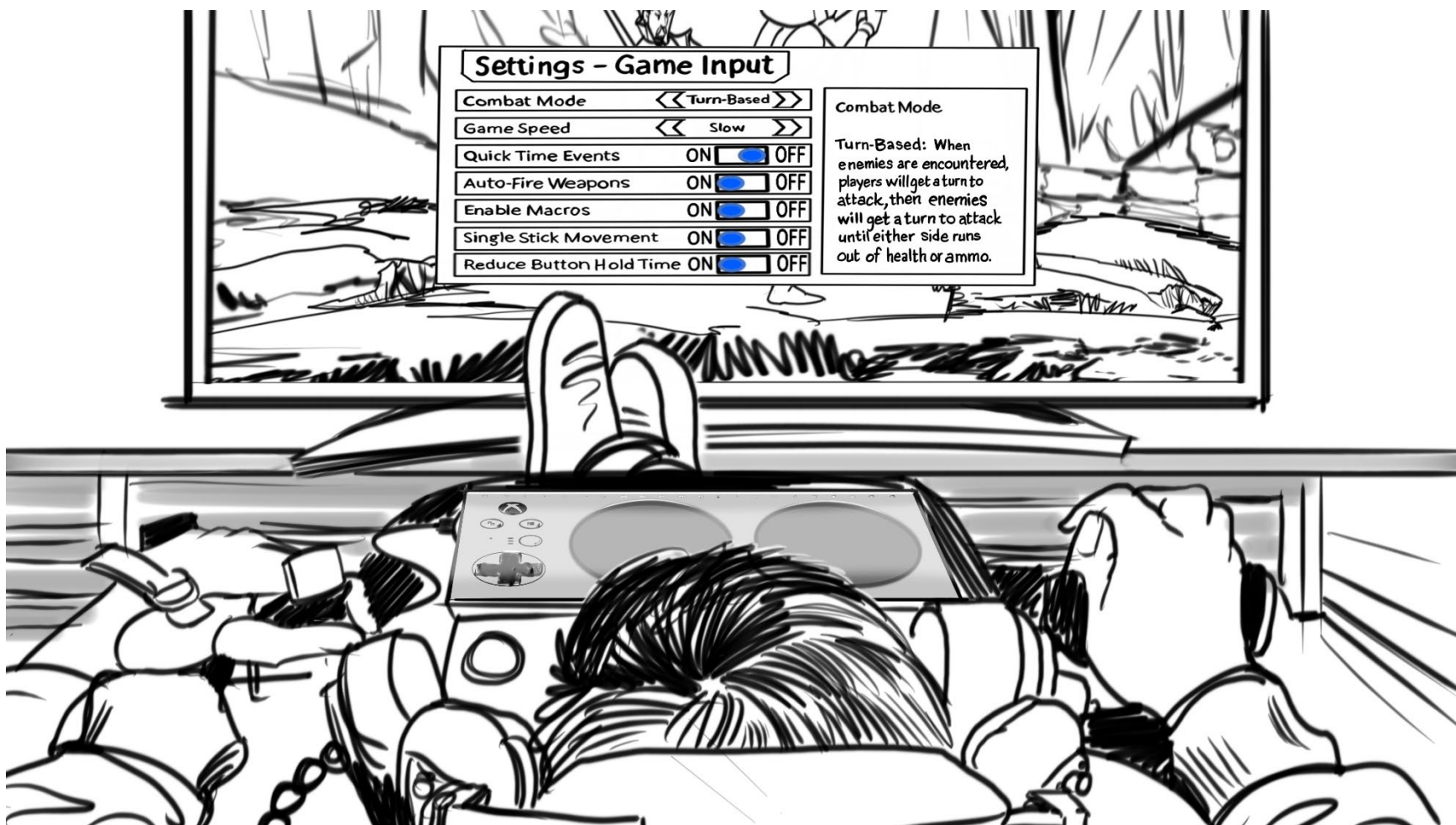
- **Players with Limited Fine Motor Skills and Manual Dexterity:** Players with limited ability to make small, precise movements of the wrists, hands, and fingers like grasping objects or hitting small buttons, triggers, or keys.
- **Players with Limited Coordination:** Players who have difficulty completing smooth, quick, or precise movements.
- **Players with Limited Endurance:** Players who experience fatigue of the hands, fingers, eyes, or other body parts used to activate control inputs while gaming.
- **Situational and Temporary Factors Impacting Mobility:** Players with environmental factors or under temporary circumstances that affect mobility such as breaking an arm or hand, or medications that can impact coordination or movement speeds.



Mobility and Gaming – Barriers and Facilitators in Action



Barrier: During an intense battle scene, this player must repetitively hit multiple inputs. Additionally, long button holds are required in this game to regenerate health. These types of inputs can be difficult for players with limited mobility; especially players using adaptive input set-ups like head-activated buttons and large joysticks.



Facilitator: Providing players the option to decrease game speeds, disable quick-time events, simplify control schemes, and customize other configurations that lessen the intensity or difficulty of physical input demands can help players enjoy the game's storyline without being blocked when physical input demands cannot be met.



Fine Motor Skills and Manual Dexterity

Players with limited ability to make small, precise movements of the wrists, hands, and fingers like grasping objects or hitting small buttons, triggers, or keys. Players may experience barriers when games require quick or complex inputs like rapidly hitting two buttons.

Fine motor skills and manual dexterity involve the small muscles and tendons in the wrists and fingers. We use our fine motor movements daily when we complete tasks like isolating our house key from the rest of our keychain, grasping the key to insert it into our front door, and turning our wrists to lock it behind us. Typing, handwriting, and bringing a cookie from a plate to your mouth all heavily involve our fine motor skills and manual dexterity. For players who have difficulty performing tasks like this with their hands and fingers, gaming activities like grasping a standard controller and accessing the multitude of buttons, triggers, and thumb sticks on it simultaneously can pose many barriers to play. While adaptive controllers and other accessible hardware allow players to use larger inputs activated by various parts of their body (feet, elbows, knees, etc.) players still often face barriers related to the amount of input controls a game requires and how often they must be “pressed.” Supporting simplified control schemes like “single-stick mode,” options that allow players to automate inputs like auto-jump, auto-fire, or toggleable controls can be helpful in reducing the need for fine motor and dexterity skills.

Barriers

- **The use of analog input**
This applies to games where players must operate one or more analog inputs with precise control (example: mice, multiple thumb sticks, joysticks, etc.).
- **The use of complex control schemes for game input**
This applies to games that require the use of more than 4-5 buttons on an input device to perform essential game tasks (example: a game that requires the use of all controller buttons consistently to successfully navigate through a game vs. a game that only requires 4 “essential” controls for navigation (example: move, jump, attack, block).
- **The use of motion controls as the only method of input for an action**
This applies to game inputs that require spatial movement of the controller or the player’s body part to activate a control.
- **The presence of quick-time-events**
This applies to the presence of game events that require quick, repetitive inputs, such as close combat, jumping onto moving platforms, etc.
- **The use of simultaneous button presses to activate a single control**
This applies to both digital and analog inputs.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Ensure that all interface components can be fully operated with digital input – even if the primary mode of input is intended to be analog**
[XAG 107: Input](#)
- **Provide players the option to enable simplified control schemes like “single stick mode”**
[XAG 107: Input](#)
- **Provide players with options to automate or “toggle” inputs that must be held for extended periods of time or are frequently pressed such as auto-fire, auto-jump, etc.**
[XAG 107: Input](#)
- **Any gameplay-critical input that uses speech or motion controls as a default has an alternative digital input mechanism (for example, a keyboard alternative for a motion-based game)**
[XAG 107: Input](#)



Limited Coordination

Players who have difficulty completing smooth, quick, or precise movements. Players may experience barriers when game inputs require precise movements like aiming at a small target.

Coordination heavily impacts our ability to complete physical tasks. For example, a person may be able to grasp a cup of water with their hand, but the act of smoothly bringing the cup directly to their lips without spilling, bumping into a nearby object, or missing their mouth by a few centimeters requires an extensive amount of motor control. For players with certain types of disabilities, coordinating muscle movements in the hands and arms can be difficult or require more time to ensure accuracy. Given the fact that gaming tasks must often be performed in a smooth, stable manner within the exact time frame that a “fire” button needs to be pressed or a car must be steered to left before veering off the road, there are many barriers that players may experience. Players with limited coordination or strength may be unable to use a standard controller. Even for players using adaptive controllers with large buttons placed around their head, arms, knees, or feet and an oversized joystick for each of their palms, coordinating finessed movements like aiming at small target or activating the correct button in the allotted amount of time provided may not be possible and thus block players from progressing. Therefore, it is important to provide players with the option to enable assist modes (like target locking), joystick sensitivity, and dead zones for joysticks and triggers. Additionally, providing options to disable or easily extend timed events can be beneficial.

Barriers

- **Games experiences that require very precise movements of analog inputs such as joysticks or mice**
This can include examples like aiming at small targets, jumping onto moving platforms, steering a car moving at fast speeds or on narrow roads, etc.
- **The presence of timed events**
This includes game experiences where players must complete an action within a specific time frame and quick-time events.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Ensure that all interface components can be fully operated with digital input – even if the primary mode of input is intended to be analog**
[XAG 107: Input](#)
- **Provide players the option to enable simplified control schemes like “single stick mode”**
[XAG 107: Input](#)
- **Allow players to disable or easily extend time limits**
[XAG 116: Time Limits](#)
- **Provide players an option to enable assists that can lessen the demand of precise motor movements (auto-target locking, etc.)**



Limited Endurance

Players who experience fatigue of the hands, fingers, eyes, or other body parts used to activate control inputs while gaming. Players may experience barriers when simplified input options, or the ability to save and pause regularly are not supported.

“Endurance” is often used when discussing activities like jogging or biking. In the context of gaming, however, players with limited mobility may experience limited endurance in their ability to use the small muscles in their fingers, hands, and wrists over prolonged periods of time. Even physical demands like holding the weight of a controller can be taxing for some. Common game input mechanics like repetitively hitting buttons and holding buttons can result in additional barriers. For example, fast-paced combat battles often require a player to press buttons quickly and continuously throughout the duration of the battle. If a player cannot meet these input demands before their character is defeated, they can be blocked from moving to the next part of the game. It is important to provide players with options that allow input customization like disabling quick time events, enabling simplified control schemes, and replacing button hold and button tap options with alternate inputs. Additionally, in-game controller remapping allows players to choose the location of commonly used buttons that are easiest for them to reach. Auto-save customization settings can also be incredibly helpful for players who need a sudden break but are unable to initiate a manual save before their character dies; the player will ideally be brought back to a recent auto-save without losing significant progress.

Barriers

- **The presence of quick-time-events**
This applies to the presence of game events that require quick, repetitive inputs, such as close combat, jumping onto moving platforms, etc.
- **The use of simultaneous button presses to activate a single control**
This applies to both digital and analog inputs (example: a game control that requires pressing the A button and Right Trigger button at the same time to initiate a specific character action).
- **The use of button holds to activate controls**
This applies to games that require players to hold inputs down for than 1-2 seconds at any point in the game (example: hold A to confirm your character selection)

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide players the option to enable simplified control schemes like “single stick mode”**
[XAG 107: Input](#)
- **Provide players with an option to automate or “toggle” inputs that must be held for extended periods of time or are frequently pressed such as auto-fire, auto-jump, etc.**
[XAG 107: Input](#)
- **Allow players to customize their save settings**
[XAG 108: Game Difficulty Options](#)



Situational and Temporary Factors Impacting Mobility

Players with environmental factors or under temporary circumstances that affect mobility such as holding a baby or having a broken hand. Players can experience barriers when they are unable to physically access their usual input devices due to situational circumstances.

Mobility can be impacted by numerous factors. For example, a person may play video games with only one hand due to permanent disabilities like limb loss, a stroke, or spinal cord injury that causes paralysis in one side of the body. A player who broke their hand and must wear a cast for 6 weeks, or a player who is holding a baby or child on their hand may also need to find one-handed input solutions. In gaming, even temporarily breaking a single finger can warrant the need for adaptive input solutions. Similarly, certain medications may cause delayed movements or impaired coordination. Very young or very old players may benefit from the same simplified control schemes or aiming assists as a person with upper body weakness due to disability. Providing game options that allow a player to customize their controls or enable assistive functions can be helpful to all players.

Situational and Temporary Factors

The following situational and temporary factors may contribute to players of all abilities experiencing barriers to gameplay

- **Injury of the hand, arm, or finger**
This can prevent players from using their traditional inputs like controllers, keyboards, or touch-based inputs in the manner they are familiar with.
- **Sickness or illness that causes fatigue**
Endurance, input speed, and coordination can be impacted by factors including increased fatigue as a result of illness.
- **Medications that may impact coordination and fatigue**
Many medications a player may be temporarily taking can result in decreased motor coordination or increased fatigue.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide players the option to enable simplified control schemes like “single stick mode”**
[XAG 107: Input](#)
- **Allow players to customize their save settings**
[XAG 108: Game Difficulty Options](#)
- **Provide players with an option to automate or “toggle” inputs that must be held for extended periods of time or are frequently pressed such as auto-fire, auto-jump, etc.**
[XAG 107: Input](#)
- **Ensure that all interface components can be fully operated with digital input – even if the primary mode of input is intended to be analog**
[XAG 107: Input](#)
- **Allow players to disable or easily extend time limits**
[XAG 116: Time Limits](#)
- **Provide players an option to enable assists that can lessen the demand of precise motor movements (auto-target locking, etc.)**



Sensation, Perception, and Gaming

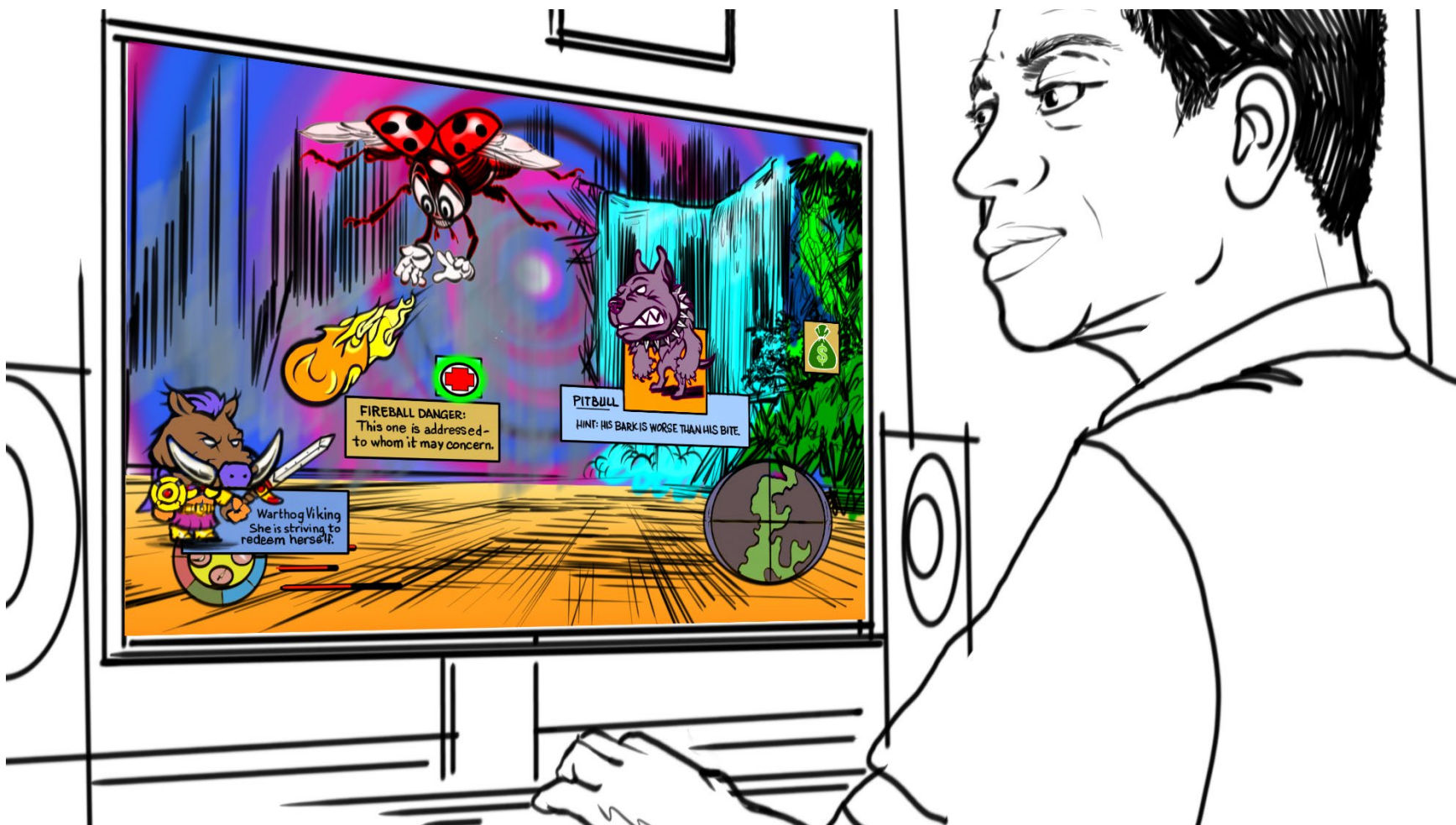
Gaming provides players with an immersive experience that leverages a multitude of sensory systems during play. Players use their visual system to see content on their screen, their auditory system to hear game sounds and cues, their tactile system to feel for button, joystick, or key locations before pressing them, and their vestibular system to inform balance and spatial orientation. Additionally, players use their proprioceptive system to inform coordination of body movement, and their interoceptive systems to inform things like pain, temperature, itch, hunger, and more. Players with disabilities like chronic pain, sensory processing disorders, photophobia, and more may be more sensitive to certain types of stimuli. In contrast, some of these players may require sensory stimuli to present at higher intensities (louder, brighter, “rougher”) to register their presence at all. Providing game options that allow players to customize the intensity of individual sensory outputs like volume levels, brightness, color scheme, haptic vibration, and more can facilitate a player’s ability to create the most comfortable and successful gaming environment for their needs.

Barriers and facilitators can differ among players with disabilities that impact sensation and perception including:

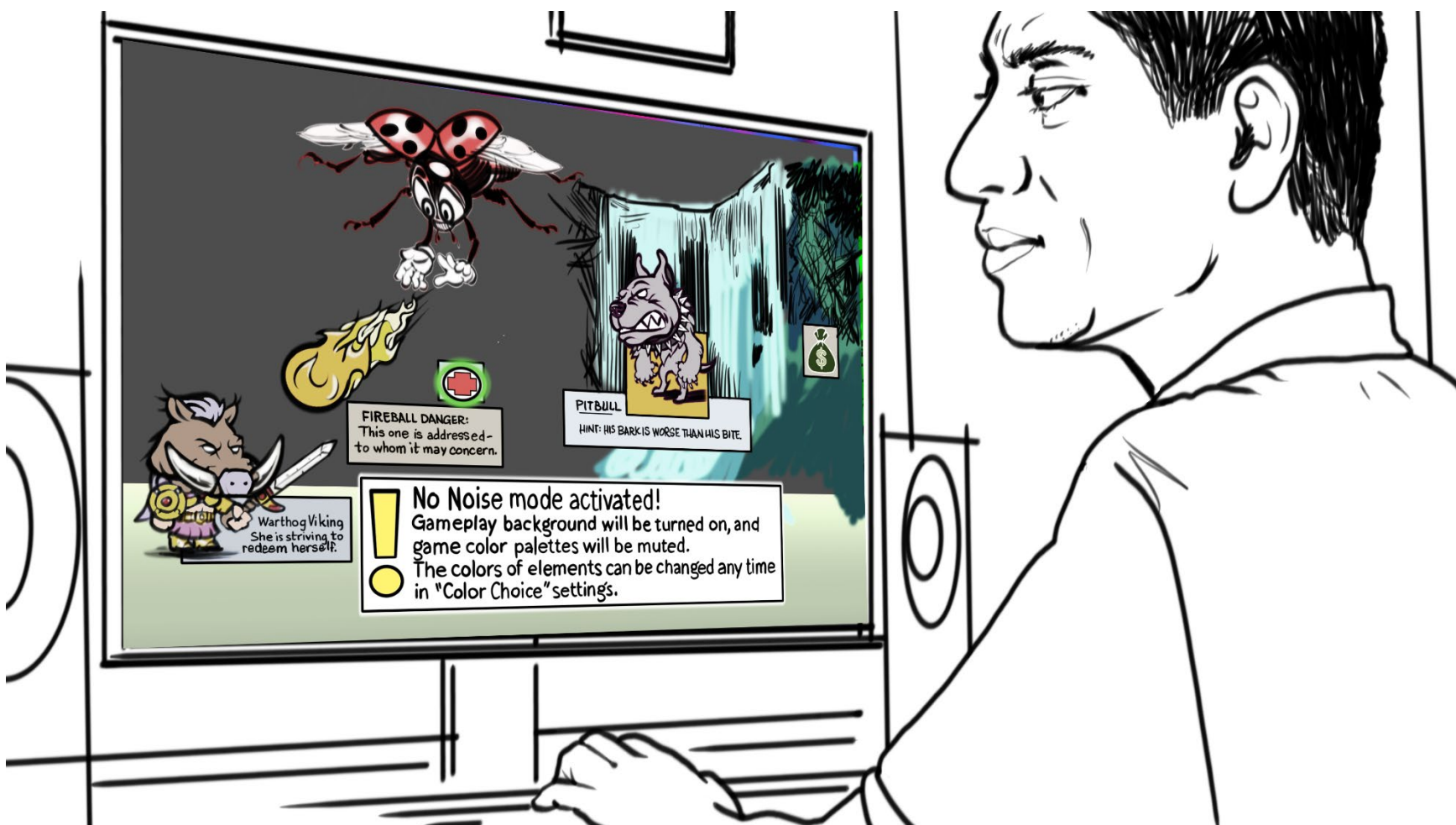
- **Players with Chronic Pain:** Players experiencing pain for prolonged periods of time that can impact their ability to use input devices.
- **Players with Hypersensitivity:** Players with increased sensitivity to sensory stimuli like sounds, visual cues, bright lights, textures, or haptic vibrations.
- **Players with Hyposensitivity:** Players with diminished ability to detect sensory stimuli like sounds, visual cues, or haptic feedback.
- **Players with Vestibular Sensitivity:** Players who experience adverse reactions to motion-based game stimuli like virtual reality experiences, camera bobbing, or other immersive display features.
- **Situational and Temporary Factors Impacting Sensation and Perception:** Players with environmental factors or under situational circumstances that affect their reactions to sensory stimuli such as having a pain flare-up, migraine, ear infection, feeling sick, and more that can temporarily cause adverse reactions to sensory stimuli.



Sensation, Perception, and Gaming – Barriers and Facilitators in Action



Barrier: While playing a game that contains bright, busy, user interfaces, this player with sensory processing disorder finds the visual stimuli to be overwhelming. This interferes with his ability to play through a game he really enjoys due to discomfort and difficulty focusing.



Facilitator: The player enables “No Noise” mode which eliminates unnecessary background animations, mutes the gameplay background and color palettes of the game, and disables non-essential audio like background music.



Chronic Pain

Players experiencing pain for prolonged periods of time that can impact their ability to use input devices. Players may experience barriers related to quick, repetitive input motions and haptic vibrations.

Players with chronic pain in their fingers, hands, wrists, elbows, or shoulders can experience barriers while playing video games. During gameplay, repetitive actions like pressing keys on a keyboard, grasping a mouse, or using a controller can place a lot of stress and tension on the small muscles of our upper body over a prolonged period. Therefore, conditions like carpal tunnel syndrome are common among individuals who use computers frequently. It is also why efforts around developing ergonomic hardware that lessens tension in the “wrong” muscles has become increasingly popular. Players can experience barriers when games require many quick and repetitive inputs. This is especially true when repetitive controls are mapped to “difficult to access” parts of a controller, like stick-clicks, by default. Players with chronic pain may find these types of movements particularly irritating to their current levels of pain.

Gameplay may need to be limited to shorter amounts of time with frequent pausing. Additionally, players with chronic pain conditions in their hands and wrists may find haptic controller vibration to intensify existing pain. Providing support for features like in-game button remapping, input options for quick-time events (button taps vs press and hold), the ability to toggle inputs on/off or automate them, and adjustments to haptic vibration intensity can help eliminate barriers to gameplay.

Barriers

- **Game mechanics that require repetitive button presses complete game tasks**
This applies to quick-time events and inputs that must frequently be activated (example: pressing “X” repeatedly to swing an axe at a tree until it falls).
- **Game controls that require inputs to be held down**
This applies to any control mechanisms that require players to hold inputs down for more than 1-2 seconds at any point in the game (example: holding the Right Trigger to accelerate a car over the duration of a 5-minute race or holding a thumb stick in the “up” position while the character walks forward over prolonged period).
- **The assignment of game controls for inputs that are particularly difficult to activate from a hardware perspective**
This includes the assignment of inputs such as “stick-click” on controllers for a consistently used game control like “jump” in a platformer title.
- **The presence of haptic controller vibration during gameplay**
This applies to the presence of controller vibration for any game, as it may irritate or increase a player’s existing arm or hand pain if it cannot be disabled.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Support in-game button remapping**
[XAG 107: Input](#)
- **Provide players with an option to automate or “toggle” inputs that must be held for extended periods of time or are frequently pressed such as auto-fire, auto-jump, etc.**
[XAG 107: Input](#)
- **Provide players with an option to toggle inputs on/off**
Example – press a button once to start shooting, press the button again to stop shooting
- **Support input customization for button tap and button hold mechanisms**
[XAG 107: Input](#)
- **Provide players with an option to customize the intensity of their controller’s haptic feedback**
[XAG 110: Haptic Feedback](#)



Hypersensitivity

Players with increased sensitivity to sensory stimuli like sounds, visual cues, brightness, textures, or haptic vibrations. Players may experience barriers when options to customize the intensity of sensory stimuli are not supported.

Gaming experiences impact a multitude of sensory systems simultaneously. The extent to which a player is impacted by sensory stimuli like screen brightness, audio volume levels, haptic vibrations, the textures of objects, and more can vary widely. For example, a player with a condition like cataracts may have heightened sensitivity to screen brightness levels, while a player with low vision can be blocked from play completely if their screen brightness is not set to 100%. In contrast, a player with autism or sensory processing disorder may find game sounds or audio cues at a conversational volume to be overstimulating. Hardware components like haptic vibrations from a controller can also be overstimulating for some players. If a player is feeling discomfort or are overwhelmed from the noises, visuals, vibrations, etc. in a game, they may need to discontinue playing altogether. It is important to provide players options to customize aspects of their gameplay experience including audio, haptic feedback intensity, color schemes, and more.

Barriers

- **The presence of game audio that cannot be adjusted**

This applies to all game noises including sound effects, background music, etc. (example: unintelligible chatter from non-player characters, gunshots or explosions, footsteps, etc.)

Note: regardless of audio content or volume, some players may wish to disable some or all game sounds.

- **The presence of bright flashes, color schemes, or screen brightness of the game interface on-screen**

This applies to game environments with bright, loud, or busy colors and patterns, as well as bright elements placed against dark backgrounds

- **Haptic controller vibration**

This applies to any vibration from a player's controller during the game, however, players may find intense stimuli like frequent vibration or pulsing vibration to be especially overwhelming.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Support audio customization of different classes of sounds**
[XAG 105: Audio Customization](#)
- **Allow players to choose the color of key game elements**
[XAG 102: Contrast](#)
- **Provide players options to disable visual distractions, especially when text is present**
[XAG 117: Visual Distractions](#)
- **Provide players an option to “darken” or simplify the background of a game if possible**
[XAG 102: Contrast](#)
- **Provide players with an option to customize the intensity of their controller's haptic feedback**
[XAG 110: Haptic Feedback](#)



Hyposensitivity

Players with diminished ability to detect sensory stimuli like sounds, visual cues, or haptic feedback. Players may experience barriers when cues or information provided by the game are subtle or cannot be adjusted in a way that makes them more prominent to the player.

In the same way that some players may perceive sensory stimuli like sounds, visual cues, or haptic vibrations more intensely, other players may not notice the sensory stimuli at all. These players essentially “under-interpret” sensory stimuli. For example, a child with sensory processing disorder who “under-registers” sensation may do things like stomping instead of walking or frequently making rough physical contact with objects or people. These behaviors are the child’s attempt to get more information from their sensory systems, as walking alone is not intense enough to register a sensory response from their bodies. The child stomps with each step to reassure themselves their foot made contact with the ground. Players of all ages who under-register sensory stimuli can easily miss audio, visual, or haptic cues that provide key information about their gameplay. This can result in negative consequences for the player or completely block them from progressing. Providing players options to customize the output “intensity” in their games including audio, visual display effects, and haptic vibrations can help players interpret game information in a way that is more perceptible to them.

Barriers

- **Presenting game cues through subtle or unclear means**
This includes the use of soft, muffled, or obscured character dialogue that is necessary to inform gameplay (example: a quick, subtle, sparkle to signify an interactable object vs a static, bright outline).
- **The use of haptics alone to inform gameplay**
This applies to the use of haptics alone to portray any important game cues or information, especially very quick or very low intensity haptic rumbles.
- **The use of color to identify game elements**
This applies to any game area where colors are used for identification, especially when colors are darker tones against dark game environments, or color options used for identification are very similar to one another (example: enemies outlines are a dark color against a dark, wooded area and go unnoticed by the player, or harmful plants and non-harmful plants are both yellow but slightly different shades of yellow).

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Support the ability to emphasize visual indicators**
Outlines of interactable elements
Notification duration or alert settings
- **Support audio customization of different classes of sounds**
[XAG 105: Audio Customization](#)
- **Provide players an option to choose the color of key elements**
[XAG 102: Contrast](#)
- **Provide players with an option to customize the intensity of their controller’s haptic feedback**
[XAG 110: Haptic Feedback](#)



Vestibular Sensitivity

Players who experience adverse reactions to motion-based game stimuli like virtual reality experiences, camera bobbing, or other immersive display features. Players may experience barriers when options to disable motion effects are not available.

The vestibular sensory system informs our sense of balance and spatial orientation. The presence of our vestibular system often goes unnoticed until things like dizziness, vertigo, or “seasickness” are present. This is because our vestibular system works behind the scenes to track our head positioning in space and sends signals to our eyes and bodies to move in ways that compensate for our head positions to keep us upright. When there is a mismatch between incoming visual information and incoming vestibular information, this can result in players feeling dizzy or nauseous. Dizziness after using VR systems is a common example of this. The player’s body may think that they are sitting motionless in their chair, while the player’s visual system assumes the body is moving based on the immersive 3D environment of the VR experience that their character is walking around in. These mixed signals between body positioning and visual information can result in dizziness. Some players with heightened sensitivity to these mismatches may experience dizziness or nausea from more subtle game visuals like motion blur, camera shake, head bobbing, low frame refresh rates, playing in “first person” view, or frequent changes in camera angle that are not initiated by the player. Providing players with options to customize these settings can help unblock those who are frequently experiencing motion-sickness, dizziness, and even migraines during normal play.

Barriers

- **The presence of motion blur**
This applies to game scenarios where backgrounds are blurred due to low frame refresh rates or as a visual signifier that a game character or object is rapidly moving across the screen (example: in a racing game the car is going extremely fast, and the surrounding environment appears blurred due to the car’s speed).
- **Obvious or frequent camera movement**
This applies to camera shake (example: an avalanche of rocks is falling in the game; the camera view also shakes).
This also applies to camera/head bobbing (example: the camera subtly bobs up and down in “first-person” views).
- **Frequent changes in camera angle**
This applies to any game where changes in camera angle occur frequently and are not player-initiated (example: the player’s character is moving around a 3D space and the camera angle automatically shifts each time the character moves to a new platform).
- **The presence of moving, scrolling, or other animated content**
This applies to all animated or moving content, especially when behind static blocks of text that a player must read.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide players options to disable visual distractions like moving and scrolling content, especially when text is present**
[XAG 117: Visual Distractions](#)
- **Provide players an option to disable display and camera options that may induce motion sickness or nausea**



Situational and Temporary Factors Impacting Sensation and Perception

Players with environmental factors or under situational circumstances that affect their reactions to sensory stimuli such as having a pain flare up, having a migraine or feeling sick, having an ear infection, and many others that may temporarily cause adverse reaction to sensory stimuli.

There are many environmental or temporary circumstances that can impact the sensitivity of players. Players with existing disabilities that impact sensory processing may have days where their pain or sensitivity levels are higher or lower than others. All players can be impacted by environmental factors like the current brightness or noise levels in the room. Playing in darker rooms or quieter rooms can make screen brightness levels and audio levels seem more intense. Players who happen to be experiencing headaches, tiredness, or anxiety, etc. may also find sensory stimuli to have more negative impact on their gameplay. Similarly, our vestibular system is located within our inner ear. As such, players experiencing an ear injury or infection may experience dizziness, nausea, or vertigo. All players may experience situational pain, sensitivity, or vestibular issues and would benefit from the ability to adjust sensory stimuli intensities.

Situational and Temporary Factors

The following situational and temporary factors may contribute to players of all abilities experiencing barriers to gameplay

- **Environmental influences that impact the way a player perceives the intensity of game stimuli**
The brightness or darkness of a room can make screen displays appear brighter or darker than they actually are.
The current volume of the room the player is in can make game audio seem quieter or louder than it actually is.
- **Pain flare ups, temporarily illnesses that exacerbate pain levels, induce nausea, migraines, etc.**
Chronic pain can vary in intensity day to day and can impact gameplay at varying levels of significance.
Things like ear injuries and ear infections can impact vestibular sensitivity, causing players to more easily become dizzy or nauseas while playing.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Support audio customization of different classes of sounds**
[XAG 105: Audio Customization](#)
- **Allow players to choose the color of key game elements**
[XAG 102: Contrast](#)
- **Provide players options to disable visual distractions, especially when text is present**
[XAG 117: Visual Distractions](#)
- **Provide players an option to “darken” or simplify the background of a game if possible**
[XAG 102: Contrast](#)
- **Provide players with an option to customize the intensity of their controller’s haptic feedback**
[XAG 110: Haptic Feedback](#)
- **Provide players an option to disable display and camera options that may induce motion sickness or nausea**

Photosensitive Epilepsy and Gaming

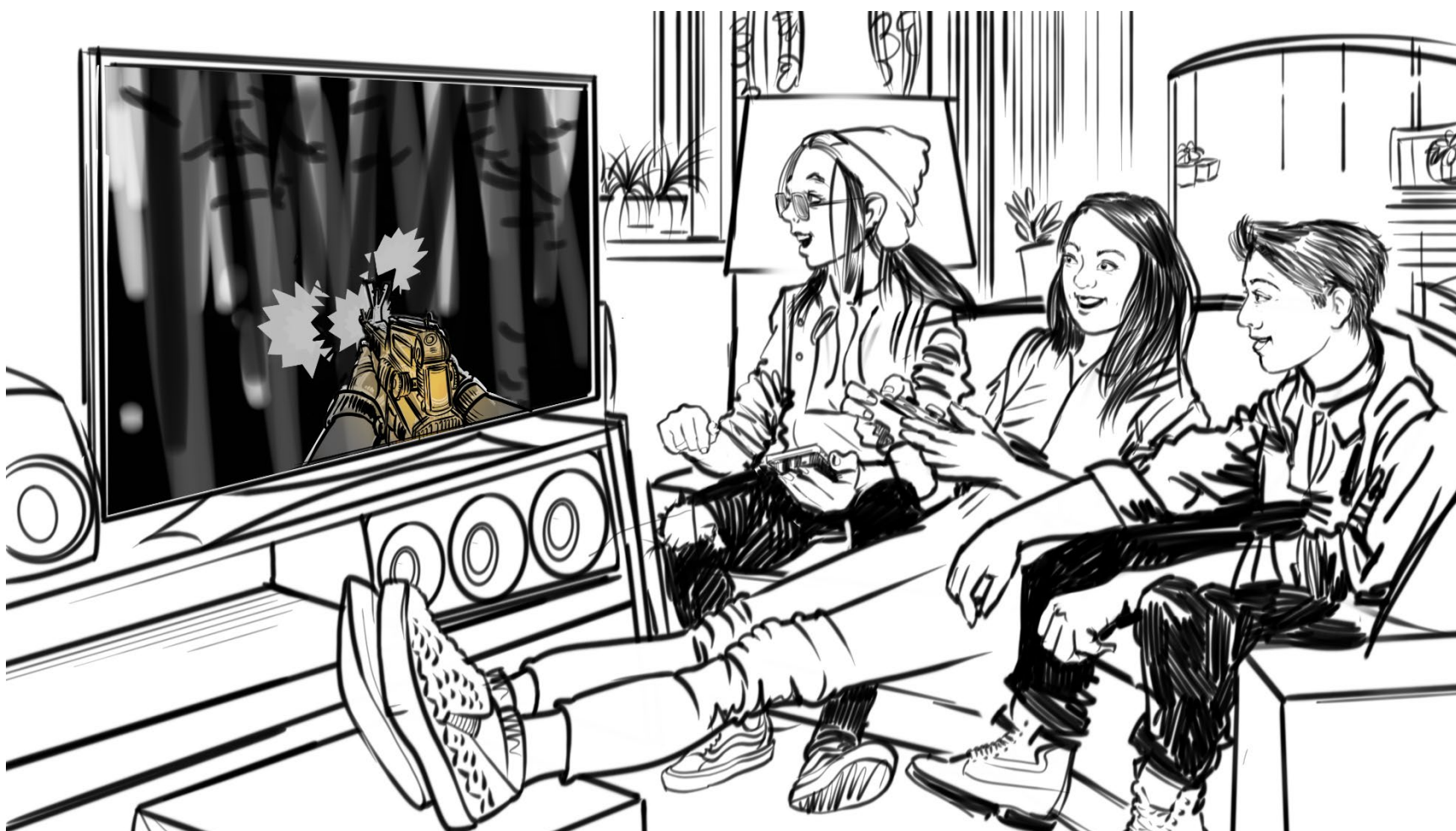
Players with photosensitive epilepsy can experience seizures that are triggered by certain types of flashing content or contrasting patterns on screen. The onset of photosensitive epilepsy is typically during childhood but can also begin at later ages. This means that a player of any age may be unaware of the fact that they have photosensitive epilepsy before playing a game. Certain types of seizures can be extremely dangerous. During some seizures, a person can experience a variety of symptoms including jerking movements, loss of control over one's body, loss of consciousness, and in some cases death. It is important to remember that seizures are not only caused by obvious full-screen flashes. Seizures can also be triggered by rapid changes in contrast on-screen such as yellow flashes from a gun firing in a dark game environment, slower, repetitive changes in contrast on screen over a prolonged period, and repeating patterns of high contrast. Ample warnings and documentation on photosensitive content in a game can be helpful for players who know they have photosensitive epilepsy. For players who are unaware that they have photosensitive epilepsy, there are additional game development choices that can be made to ensure a game is void of seizure inducing visual content for other players.

- **Photosensitive Epilepsy:** Players who experience seizures when exposed to flashes of certain intensities and sizes or certain visual patterns.

Photosensitive Epilepsy and Gaming – Barriers and Facilitators in Action



Barrier: While playing a first-person shooter game, this player finds their character under attack during nighttime. The large white flashes contrasting against the dark nighttime environment coming from the player's machine gun are occurring at a frequency of more than 3 flashes per second and take up more than 20 percent of the screen. This on-screen content could trigger a seizure in any of the individuals viewing the screen who may not be aware of having photosensitive epilepsy.



Facilitator: To avoid the risk of triggering photosensitive seizures, game developers did not change the content of their game, but instead adjusted photosensitive elements by decreasing the size of flashes, the frequency in which they occur, and the contrast ratio of the flash color against the background environment.

Photosensitive Epilepsy

Players who experience seizures when exposed to flashes of certain intensities and sizes or certain visual patterns. Players can experience potentially dangerous barriers when games contain visual content known to induce photosensitive seizures.

Players with Photosensitive Epilepsy (PSE) can experience seizures when exposed to on-screen game content like rapid flashes, strobing, and visual patterns or geometric shapes with contrasting colors like black and white stripes. Providing ample warnings for players regarding photosensitive content in a game can be helpful for those aware of having photosensitive epilepsy. However, many players may not be aware, as photosensitive epilepsy can begin at any age. Therefore, it is important to avoid “flashing” or “spatial patterns” that can induce seizures altogether. A “flash” is often thought of as a sudden burst of white or yellow light for a brief period. In the context of photosensitive epilepsy, “flashes” do not necessarily need to be bright white or yellow. Instead, “flash” can refer to any sudden change in contrast of over 10% of the darker color value on screen. For example, pink “flashes” on a navy-blue screen would be applicable if the difference in contrast ratio between those two colors is above 10%.

In addition to contrast, other factors like the frequency of the flashing (the number of flashes per second that occur), the “size” of the flash, or the duration that the flashing occurs all play a role in whether rapid contrast changes are likely to trigger a seizure. Certain spatial patterns or alternating bands of color such as two different colored stripes that highly contrast with each other can also be problematic. There are considerations developers can make around color choices, frequencies, and sizes of “flashing” content that can help reduce the risk of players experiencing seizures during gameplay. Additionally, all game content should be assessed for the presence of photosensitive epilepsy provocative content through available third-party testing software.

Barriers

- **The presence of flashing content under the following conditions:**
 - The frequency of flashing content is more than 3 flashes per second
 - The change in contrast between the “flash” color and background color is greater than 10%
 - The size of the flash on screen is larger than 20% of the screen size
 - The flash occurs at lower frequencies but over an extended period
- **The presence of rolling or flickering elements on-screen**

Red color flicker is more likely to induce seizures than white or blue.
- **The presence of visual patterns or geometric shapes with two highly contrasting colors**

This includes horizontal or vertical stripes as well as alternating patterns.
- **Player proximity to their screen or device**

Even flashes that do not take up at least 20% of the screen can induce seizures if a player is sitting too close to their screen.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Reduce contrast between the brightest and darkest points of the flash**
[XAG: 118 Photosensitivity](#)
- **Reduce flash frequency**
[XAG: 118 Photosensitivity](#)
- **Decrease the size of flashing content**
[XAG: 118 Photosensitivity](#)
- **Reduce contrast between pattern bands**
[XAG: 118 Photosensitivity](#)
- **Reduce the size of the pattern**
[XAG: 118 Photosensitivity](#)
- **Provide player warnings about proximity to screen**

If your game contains flashing or contrasting patterns of smaller sizes, it is best to provide additional warnings to players about their proximity to their screen.



Mental Health Conditions and Gaming

Playing video games can impact aspects of mental and emotional well-being by helping players relax, temporarily distract from reality or routine, and spend time with friends in an immersive way. Mental and emotional well-being is a core aspect in the lives of all people and can be influenced at any time by situational factors like upcoming work deadlines, temporary factors like family illness, as well as long-term factors like mental health conditions. Mental health conditions include a wide range of diagnosable conditions such as depression, anxiety disorders, schizophrenia, eating disorders and substance use disorders. Various aspects of mental and emotional well-being may affect a person's decision-making, stress, anxiety levels, and more. While gaming may provide many benefits to a player's sense of well-being, these considerations are important as certain game content, themes, or mechanics can also elicit negative or even harmful reactions for a player. Common examples include game content that features drugs, alcohol, or other addictive substances and behaviors. Additionally, certain game content like sexual abuse, domestic violence, and other traumas can trigger reactions in players with traumatic stress related to real-life events being depicted in the game. Common fears or phobias should also be taken into consideration.

It is important to understand that guidance on mental and emotional well-being is not intended to instruct developers to change the content, themes, storylines, or artistic visions of their game. Rather, the intent of mental and emotional well-being guidance related to gaming is to encourage developers to provide customization options, as well as adequate warnings and reference materials that players can review before purchasing a game if their game contains content or themes commonly known to be harmful. This allows players to make informed decisions before purchasing or playing through a game that may contain triggering or harmful content.

Barriers and facilitators can differ among players with mental health disabilities including:

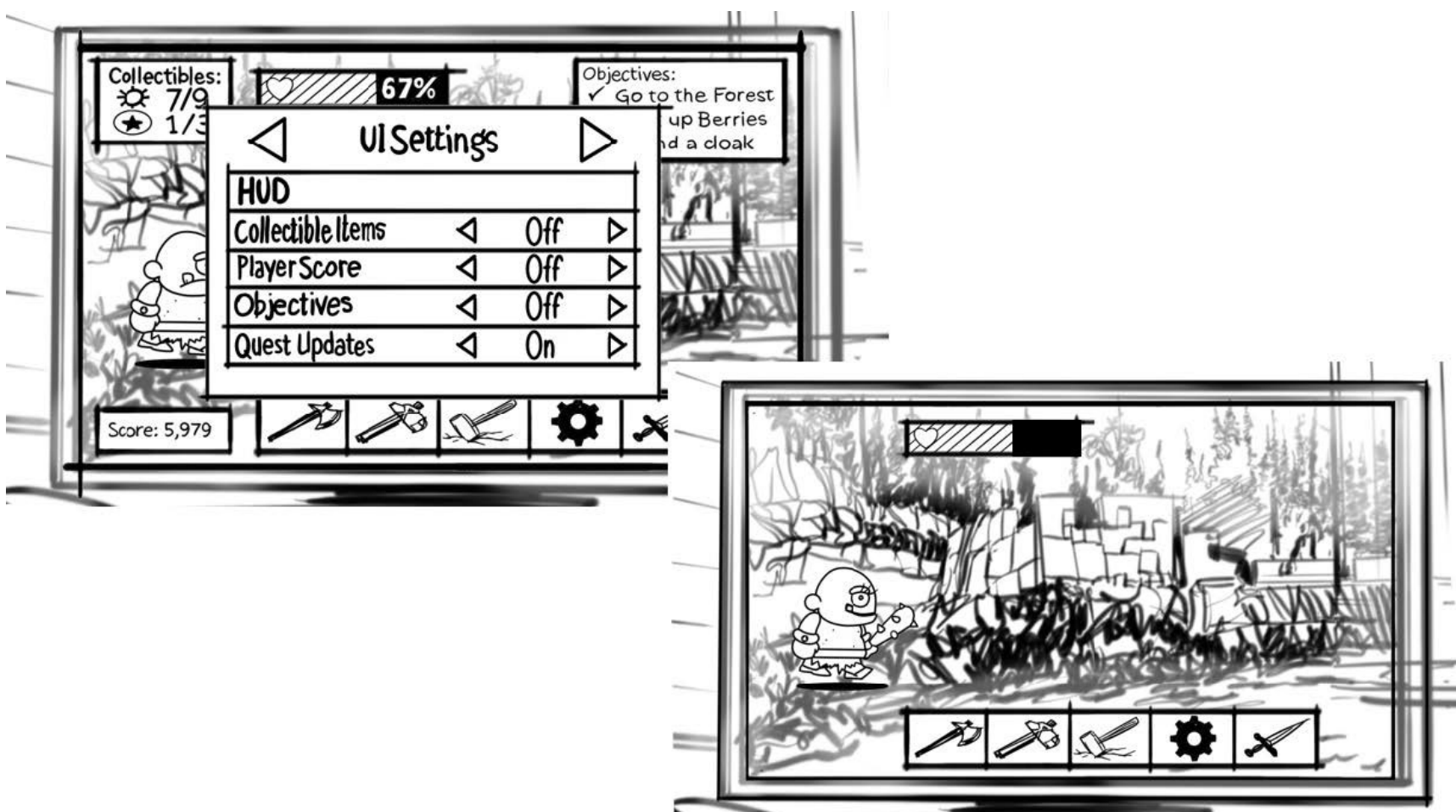
- **Obsessions and Compulsions:** Players who experience unwanted reoccurring thoughts and/or behaviors.
- **Aversions:** Players who experience adverse responses to specific types of content that may remind or trigger them about stressful, scary, or dangerous events that happened in their lives.
- **Addictions:** Players who currently or have previously experienced addiction and wish to avoid exposure to content or game themes that depict addictive behaviors or items.
- **Situational and Temporary Factors Impacting Mental Health Conditions:** Players experiencing environmental or temporary circumstances that impact their current state of mental health and wellbeing during gameplay.



Mental Health Conditions and Gaming – Barriers and Facilitators in Action



Barrier: The heads-up display on this player's screen includes the number of collected items, player score, health meter, and current objectives. This player experiences obsessive and compulsive thoughts when values and scores on screen are incomplete or end in odd numbers. The player finds it difficult to progress through the game until all collectible items and objective tasks are complete in each game area, and his Gamerscore value is an even number.



Facilitator: The game provides options for players to choose which of the heads-up display elements they would like visible on screen. He disables the visual elements that tend to evoke obsessive and compulsive thoughts.



Obsessions and Compulsions

Players who experience unwanted reoccurring thoughts and/or behaviors. Players may experience barriers when games do not provide opportunities for the player to customize or disable certain aspects of gameplay like scores, achievements, or objectives.

Obsessions and compulsions are incredibly complex and can impact all facets of a person's life. There are many different mental health conditions that can cause repetitive thoughts that elicit fear or anxiety and unwanted reoccurring behaviors or actions. Common obsessions and compulsions can include thoughts around germs or contamination, safety, symmetry, order/organization, and frequently "checking" items for reassurance. In games, certain mechanics, score tracking, achievements, collectible items, and layout of on-screen items can cause barriers for players. For example, a player may experience anxiety, or even restart the game if they do not collect all items on a level or have a Gamerscore value with odd numbers in it. Similarly, many players may experience anxiety if they feel as though they have "missed" something in the game. Games that prevent a player from revisiting a prior level or easily restarting from previous points in the game can elicit major barriers. Other common barriers can be presented in scenarios that impact the "symmetry" of game components such as gamer scores ending in odd numbers, "unchecked" objectives present on screen, and other imperfect or asymmetrical mechanics.

Barriers

- **The presence of collectible items or achievements**
This includes game experiences that do not allow players to revisit past areas of the game after missing an opportunity to find a collectible item or fulfill a non-essential objective that does not block progress.
- **A lack of auto-save configurability**
This applies when the auto-save frequency in a game is too long or short, as this prevents players from being able to go back to the exact point in the game that they wish to visit.
- **The presence of time limits**
This applies to time limits to complete tasks, or time limits in which a player can be in a certain area of the game. (example: time limits that prevent players from fully exploring or "checking" all aspects of an area in the game before the timer runs out).
- **Lack of customization options for display content**
This applies to options that allow players to enable or disable the visibility of on- screen elements like player scores, objectives, health, and other elements that may contain things like uneven numbers, incomplete objective lists or other asymmetric visuals.

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Allow players to revisit previous areas of the game under all circumstances**
- **Allow players to self-initiate game saves at the exact time of their choosing**
- **Allow players to disable or easily extend time limits during gameplay**
- **Allow players to customize the types of content displayed on screen or within reference materials including player scores, progress tracking, number of items collected, outstanding objectives, etc.**



Aversions

Players who experience negative responses when exposed to content that may remind or trigger them about stressful, dangerous, or traumatic events they have experienced. Players may experience barriers when they are unaware that this content exists within the game prior to playing.

Games provide players with incredibly unique experiences and opportunities to “live vicariously” through their character as they navigate storylines and narratives. These storylines and narratives often closely reflect real-life themes that resonate with players by eliciting relatable, strong emotional responses that can help make players feel more connected to their gameplay or character. However, players that have experienced physical or emotional trauma due to real-life experiences may wish to avoid games that present themes or content areas that remind them of their lived traumatic experiences. Common subject areas that can elicit strong negative responses for a player with conditions like post-traumatic stress disorder can often include themes of sexual or physical abuse, violence (assault, robberies, or murder), military combat, natural disasters, a sudden death of a loved one, and more. For these players, unexpectedly viewing this content can trigger severe negative reactions like panic attacks, flashbacks, agitation, dizziness, fainting, and other harmful or intense symptoms.

Additionally, games may contain content known to be the source of common phobias, such as arachnophobia, which can cause adverse player reactions. While it is not expected that developers avoid the use of all content that may elicit adverse reactions for any player, it is important to provide publicly available documentation that calls out the presence of content known to commonly trigger players with post-traumatic stress disorders or phobias. This allows players to make an informed decision before purchasing or playing a game. Initial game-launch warnings and in-game warnings that allow players to skip things like cutscenes or objectives that contain this type of content can also support players who may not have been aware of its presence before purchasing.

Barriers

- **Game content or themes that reflect experiences commonly known to be traumatic or triggering for players including:**
 - › Sexual or physical abuse
 - › Violence (assault, robbery, murder)
 - › War zones or military combat
 - › Natural Disasters
 - › Sudden death of family members and loved ones
- **Game content or themes commonly known to be the source of phobias including:**
 - › Arachnophobia (Fear of Spiders)
 - › Ophidiophobia (Fear of Snakes)
 - › Claustrophobia (Fear of confined spaces)
 - › Other common phobias

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide accessible documentation that can be viewed prior to game purchase that describes any game content or in-game events that may be triggering or traumatic for a player to watch**
[XAG 123: Advanced Best Practices](#)
- **Provide players with in-game warnings and reminders regarding triggering or traumatic content**
[XAG 123: Advanced Best Practices](#)
- **Provide players an option to skip cutscenes or objectives that contain triggering or traumatic content**
[XAG 123: Advanced Best Practices](#)



Addictions

Players who currently have or have had an addiction in the past and wish to avoid game content or themes related to those experiences. Players may experience barriers when adequate documentation or warnings are not made available prior to purchase that outline the presence of this content in the game.

Games often feature content and themes that parallel common real-world experiences. This can make games feel more relatable, engaging, or immersive for many players. Among these real-world themes, content like alcohol, drugs, medications, gambling, or other addictive substances and behaviors may be included as part of the game’s storyline. Players who have experienced or are currently experiencing an addiction may wish to avoid certain game tasks, cutscenes, or games in their entirety if addictive substances or themes of addiction are present, as these can remind a player of their own experiences. For example, even a light-hearted cartoon game can contain mechanisms where their character must complete tasks like placing bets to obtain items. Though unintended, this type of risk-reward mechanism may induce emotional responses for a player with a past gambling addiction. These experiences can result in adverse emotional or physical reactions and in some cases potential re-engagement in past addictive behaviors.

While it is not expected that developers change the content of their game based to avoid all references to potentially addictive substances or behaviors, it is important to provide publicly available documentation that calls out the presence of content or themes like alcohol, drugs, gambling, etc. This allows players to make an informed decision before purchasing or playing a game. Initial game-launch warnings and in-game warnings that allow players to skip things like cutscenes or objectives that contain this type of content can also support players who may not have been aware of its presence before purchasing.

Barriers

- **Game content, storylines, tasks, or missions that feature addictive substances or themes of addiction including:**
 - Alcohol
 - Drugs
 - Abuse of prescription medications
 - Gambling
 - Other addictive substances or behaviors

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide accessible documentation that can be viewed prior to game purchase that describes any game content or in-game events that feature alcohol, drugs, or other addictive substances or behaviors**
[XAG 123: Advanced Best Practices](#)
- **Provide players with an option to turn on in- game warnings and reminders regarding upcoming cut-scenes, full-motion videos, objectives, tasks, or visible content that features alcohol, drugs, or other addictive substances or behaviors**
[XAG 123: Advanced Best Practices](#)
- **Provide players an option to skip cutscenes or missions that contain or reference alcohol, drugs, or other addictive substances or behaviors**
[XAG 123: Advanced Best Practices](#)



Situational and Temporary Factors Impacting Mental Health Conditions

Players with situational factors or under temporary circumstances that impact various aspects of their mental and emotional well-being including stress, meeting deadlines, family illness, etc.

Our mental and emotional well-being can be influenced at any time by situational or temporary factors. Additionally, these situational or temporary factors can also influence a person’s mental health condition. Situational factors can include things like lack of sleep the night a large test or an upcoming work deadline that causes feelings of stress or anxiety. Additionally, temporary situations like family member illness, or losing one’s job can negatively impact mental and emotional well-being. Similarly, a player with an existing mental health condition may find that situational or temporary life stressors exacerbate the symptoms of their mental health condition. For example, a player with obsessive or compulsive thoughts may find that stress from work results in their obsessive and compulsive thoughts occurring more frequently. Providing players with options to customize their gameplay like enabling in-game content warnings, skipping, or hiding content, and adjusting the types of information that appear in a heads-up display can ensure that players with mental health conditions, as well as those in temporary or situational circumstances impacting their mental and emotional well-being can tailor game experiences to meet their needs on any given day.

Situational and Temporary Factors

The following situational and temporary factors may contribute to players of all abilities experiencing barriers to gameplay

- **There are many situational and temporary factors that can impact a player’s sense of mental and emotional well-being, or exacerbate a player’s current mental health conditions including:**
 - Lack of sleep
 - Upcoming life stressors like work or school deadlines
 - Personal or family member illness
 - Longer term stressors like losing a job

Facilitators

** Please refer to the following sections of the [Xbox Accessibility Guidelines](#) for detailed guidance on facilitator implementation*

- **Provide players with an option to turn on in- game warnings and reminders regarding upcoming cut-scenes, full-motion videos, objectives, tasks, or visible content that may be triggering or traumatic for a player to view, or contains references to addictive substances or behaviors**
[XAG 123: Advanced Best Practices](#)
- **Provide players an option to skip cutscenes or missions that contain or reference triggering or traumatic content, or references to addictive substances or behaviors. alcohol, drugs, or other addictive substances or behaviors**
[XAG 123: Advanced Best Practices](#)
- **Allow players to customize the types of content displayed on screen or within reference materials including player scores, progress tracking, number of items collected, outstanding objectives, etc.**

Barrier and Facilitator Summary Tables

Vision and Gaming		
	Barriers	Facilitators
No Vision	<ul style="list-style-type: none">Portraying information solely through text-based elementsPortraying information solely through visual cuesMouse or touch-based inputs	<ul style="list-style-type: none">Provide narration for all game text (XAG 106)Support spatial audio (XAG 105)Represent visual cues aurally (XAG 103)Represent visual cues through haptic feedback (XAG 103)Provide audio descriptions for full-motion videos and cutscenes (XAG 111)Support audio customization for different classes of sound (XAG 105)Ensure the entire game experience is operable using digital-only inputs (XAG 107)
Low Vision	<ul style="list-style-type: none">Text display (size, spacing, and font type) across all game experiencesVisual cue sizeContrast ratios of elements against their backgroundPlacement of visual elements on screen	<ul style="list-style-type: none">Support text and UI scaling (XAG 101)Provide serif and sans-serif font options (XAG 101)Meet minimum spacing guidelines (XAG 101)Support the option to apply opaque backgrounds behind text (XAG 102)Support magnification tools (XAG 101)Support color selection tools for text color, background color, and key elements (XAG 102)Provide players the option to move important UI elements like HUD placement, inventory bars, etc. to areas of the screen of their choosing
Color Vision Deficiency (Colorblindness)	<ul style="list-style-type: none">Use of color alone for identificationColor assignments of key visual cues against the background environment colorText color vs background color	<ul style="list-style-type: none">Provide choice of color for all key game elements (XAG102)Provide the option to enable opaque backgrounds behind text (XAG 102)Provide colorblind filters with a slider that allows the “intensity” of the filter to be adjusted (XAG 102)Support platform-level high contrast modes or provide one (XAG 102)
Situational and Temporary Factors Impacting Vision	<ul style="list-style-type: none">Screen glare that obscures content or diminishes visibilityPlaying on a small screenUse of screen filters that obscure colors	<ul style="list-style-type: none">Support text and UI scaling (XAG 102)Support magnification tools (XAG 101)Support color selection tools for text color, background color, and key elements (XAG 102)Support platform-level high contrast modes or provide one (XAG 102)

Hearing and Gaming		
	Barriers	Facilitators
No Hearing	<ul style="list-style-type: none">• Providing cues through audio channels alone• The use of spatial/directional audio• Full-motion video and cutscene dialogue that provides key game information through audio channels alone• Player-to-player communication channels that only support speech-based input and output	<ul style="list-style-type: none">• Represent audio cues through additional channels (aural, visual, and haptic) (XAG 103, XAG 110)• Support subtitles and captions for character dialogue and in-game sounds (XAG 104)• Provide directional indications of where an audio cue or dialogue is coming from (XAG 104)• Provide Text-to-Speech and Speech-to-Text Transcription (XAG 120)• Provide player-to-player communication platforms that are not speech-based (text-chat) (XAG 120)• Provide full transcripts of game narration and dialogue online for player reference (XAG 104)
Limited Hearing (Hard of Hearing)	<ul style="list-style-type: none">• Playing multiple audio tracks simultaneously• The use of very high or very low frequency audio• The use of low quality or intentionally obscured audio	<ul style="list-style-type: none">• Provide customization options for individual types of audio (XAG 105)• Provide subtitles and captions (XAG 104)• Represent audio cues through additional channels (aural, visual, and haptic) (XAG 103, XAG 110)
Asymmetrical Hearing	<ul style="list-style-type: none">• The use of spatial or stereo audio alone to inform players about the direction a sound is coming from	<ul style="list-style-type: none">• Provide an option to toggle mono audio on and off (XAG 105)• Provide an option to enable subtitles and captions (XAG 104)
Situational and Temporary Factors Impacting Hearing	<ul style="list-style-type: none">• Loud or busy environments• Lack of access to headphones• Lack of access to a headset with a microphone• Extremely quiet environments• Temporary hearing loss due to injury, ear infection, etc.	<ul style="list-style-type: none">• Represent audio cues through additional channels (aural, visual, and haptic) (XAG 103, XAG 110)• Support subtitles and captions for character dialogue and in-game sounds (XAG 104)• Provide directional indications of where an audio cue or dialogue is coming from (XAG 104)• Provide text-to-speech and speech-to-text transcription (XAG 120)• Provide player-to-player communication platforms that are not speech-based (text-chat) (XAG 120)• Provide full transcripts of game narration (XAG 120)

Speech, Communication, and Gaming		
	Barriers	Facilitators
Non-Verbal	<ul style="list-style-type: none">• Player-to-player communication channels that only support speech-based input and output• Sound-based or speech-recognition based inputs• Lack of options for non-verbal players to communicate with other online players about their communication preferences	<ul style="list-style-type: none">• Support text-based and symbol-based (emojis & emotes) player-to-player communication options (XAG 120)• Support text-to-speech transcription (XAG 120)• Support digital input controls across the entire game experience that can be used in place of speech-based, or voice-recognition-based inputs (XAG 107)• Provide an option that lets players search through game servers or matchmaking lobbies by communication preference type.• Provide player-to-player communication platforms that are not speech-based such as text-chat (XAG 120)
Limited Communication	<ul style="list-style-type: none">• Player-to-player communication channels that only support speech-based input and output• Text-based player-to-player communication methods that require free form text input• Sound-based or speech-recognition based inputs	<ul style="list-style-type: none">• Support text-based and symbol-based (emojis & emotes) player-to-player communication options (XAG 120)• Provide pre-written communication options such as chat wheels or a “quick reply” options list (XAG 120)• Support text-to-speech transcription (XAG 120)• Support digital input controls across the entire game experience that can be used in place of speech-based, or voice-recognition-based inputs (XAG 107)• Provide an option that lets players search through game servers or matchmaking lobbies by communication preference type.• Provide player-to-player communication platforms that are not speech-based such as text-chat (XAG 120)
Situational and Temporary Factors Impacting Speech and Communication	<ul style="list-style-type: none">• Very loud environments• Very quiet environments• Lack of access to a headset• Player age• Language barriers	<ul style="list-style-type: none">• Support voice-based and text-based communication channels (XAG 120)• Support symbol-based communications like emojis and emotes, and pre-written communication options such as chat wheels or a “quick reply” options list (XAG 120)• Support speech-to-text and text-to-speech transcription (XAG 120)• Support digital input controls across the entire game experience that can be used in place of speech-based, or voice-recognition-based inputs (XAG 107)• Provide an option that lets players search through game servers or matchmaking lobbies by communication preference type.• Support screen narration of incoming text-based communications (XAG 106, XAG 120)

Cognition and Gaming		
	Barriers	Facilitators
Learning and Cognitive Processing	<ul style="list-style-type: none"> The use of advanced or complex language to present information The presence of time limits for completing tasks or reading on-screen text Lack of corrective feedback provided by the game 	<ul style="list-style-type: none"> Present information in a clear, concise manner that accommodates a wide range of language and literacy skills (XAG 123) Portray information through multiple methods to supplement text (symbols/glyphs, audio description, images) (XAG 103) Adequately label menu and in-game elements (XAG 114) Allow players to dismiss tutorials or dialogue via button prompts or easily extend time limits (XAG 116) Allow players to reference control schemes, objectives, "glossaries," or key terms and items at any time (XAG 109) Provide an option to enable waypoint markers, directional cues, and/or automatic cues and hints when the game senses that the player is stuck (XAG 109)
Attention	<ul style="list-style-type: none"> The presence of notifications or pop-ups during gameplay The presence of audio distractions The presence of visual distractions The presence of time limits for completing tasks or reading on-screen text 	<ul style="list-style-type: none"> Allow players to adjust notification frequency and timing (XAG 116) Provide players the ability to customize the volume of audio channels independently of one another (XAG 105) Consider providing "high contrast" modes that mute non-essential background colors and elements (XAG 102) Allow players to self-initiate dismissing objectives, cues, or dialogue or provide an ability to easily extend time limits (XAG 116) Allow the player to reference control schemes, objectives, "glossaries" or key terms and items at any time. (XAG 109)
Memory	<ul style="list-style-type: none"> Relaying crucial gameplay information through character dialogues, cutscenes, or narratives that cannot be referenced later Games with multiple objectives, tasks, and side-quests Game objectives that require pre-requisites to complete tasks 	<ul style="list-style-type: none"> Allow players to revisit the game's narrative such as replaying cutscenes or reading a summary of the narrative (XAG 109) Provide options to enable waypoint markers, directional cues, hints, or other directional reminders (XAG 109) Allow players to review tasks, objectives, and in-game tutorial instructions at any given time (XAG 109) Allow players to review progress made (XAG 109) Allow players to review controller mappings and button assignments at any time

Situational and Temporary Factors Impacting Cognition	<ul style="list-style-type: none">• Distracting environments• Frequency of gameplay• Player Age• Emotional or psychological factors	<ul style="list-style-type: none">• Present information in a clear, concise manner that accommodates a wide range of language and literacy skills (XAG 123)• Portray information through multiple methods to supplement text (symbols/glyphs, audio description, images) (XAG 103)• Allow players to revisit the game’s narrative such as replaying cutscenes or reading a summary of the narrative (XAG 109)• Provide options to enable waypoint markers, directional cues, hints, or other directional reminders (XAG 109)• Allow players to review tasks, objectives, controller mappings, and in-game tutorial instructions at any given time (XAG 109)• Allow players to review progress made (XAG 109)• Adequately label menu and in-game elements (XAG 114)• Allow players to dismiss tutorials or dialogue via button prompts or easily extend time limits (XAG 116)
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Mobility and Gaming		
	Barriers	Facilitators
Fine Motor Skills and Manual Dexterity	<ul style="list-style-type: none">• The use of analog input• The use of complex control schemes for game input• The use of motion controls as the only method of input for an action• The presence of quick-time-events (QTEs)• The use of simultaneous button presses to activate a single control	<ul style="list-style-type: none">• Ensure that all interface components can be fully operated with digital input – even if the primary mode of input is intended to be analog. (XAG 107)• Provide players the option to enable simplified control schemes like “single stick mode” (XAG 107)• Provide players with options to automate or “toggle” inputs that must be held for extended periods of time or are frequently pressed such as auto-fire, auto-jump, etc. (XAG 107)• Any gameplay-critical input that uses speech or motion controls as a default has an alternative digital input mechanism (for example, a keyboard alternative for a motion-based game). (XAG 107)
Limited Coordination	<ul style="list-style-type: none">• Game experiences that require very precise movements of analog inputs such as joysticks or mice• The presence of timed events	<ul style="list-style-type: none">• Ensure that all interface components can be fully operated with digital input – even if the primary mode of input is intended to be analog. (XAG 107)• Provide players the option to enable simplified control schemes like “single stick mode” (XAG 107)• Allow players to disable or easily extend time limits (XAG 116)• Provide players an option to enable assists that can lessen the demand of precise motor movements (auto-target locking, etc.)
Limited Endurance	<ul style="list-style-type: none">• The presence of quick-time events• The use of simultaneous button presses to activate a single control• The use of button holds to activate controls	<ul style="list-style-type: none">• Provide players the option to enable simplified control schemes like “single stick mode” (XAG 107)• Provide players with an option to automate or “toggle” inputs that must be held for extended periods of time or are frequently pressed such as auto-fire, auto-jump, etc. (XAG 107)• Allow players to customize their save settings (XAG 108)
Situational and Temporary Factors Impacting Mobility	<ul style="list-style-type: none">• Injuries of the hand, arm, or finger• Sickness or illness that causes fatigue• Medications that may impact coordination and fatigue	<p>Provide players the option to enable simplified control schemes like “single stick mode” (XAG 107)</p> <ul style="list-style-type: none">• Provide players with an option to automate or “toggle” inputs that must be held for extended periods of time or are frequently pressed such as auto-fire, auto-jump, etc. (XAG 107)• Allow players to customize their save settings (XAG 108)• Ensure that all interface components can be fully operated with digital input – even if the primary mode of input is intended to be analog. (XAG 107)• Allow players to disable or easily extend time limits (XAG 116)• Provide players an option to enable assists that can lessen the demand of precise motor movements (auto-target locking, etc.)

Sensation, Perception, and Gaming		
	Barriers	Facilitators
Chronic Pain	<ul style="list-style-type: none">Game mechanics that require repetitive button presses complete game tasksGame controls that require inputs to be held downThe assignment of game controls for inputs that are particularly difficult to activate from a hardware perspectiveThe presence of haptic controller vibration during gameplay	<ul style="list-style-type: none">Support in-game button remapping (XAG 107)Provide players with an option to automate or “toggle” inputs that must be held for extended periods of time or are frequently pressed such as auto-fire, auto-jump, etc. (XAG 107)Provide players with an option to toggle inputs on/offSupport input customization for button tap and button hold mechanisms (XAG 107)Provide players with an option to customize the intensity of their controller’s haptic feedback (XAG 110)
Hypersensitivity	<ul style="list-style-type: none">The presence of game audio that cannot be adjustedThe presence of bright flashes, color schemes, or screen brightness of the game interface on-screenHaptic controller vibration	<ul style="list-style-type: none">Support audio customization of different classes of sounds (XAG 105)Allow players to choose the color of key game elements (XAG 102)Provide players options to disable visual distractions, especially when text is present (XAG 117)Provide players an option to “darken” or simplify the background of a game if possible (XAG 102)Provide players with an option to customize the intensity of their controller’s haptic feedback (XAG 110)
Hyposensitivity	<ul style="list-style-type: none">Presenting game cues through subtle or unclear meansThe use of haptics alone to inform gameplayThe use of color to identify game elements	<ul style="list-style-type: none">Support the ability to emphasize visual indicatorsSupport audio customization of different classes of sounds (XAG 105)Provide players an option to choose the color of key elements (XAG 102)Provide players with an option to customize the intensity of their controller’s haptic feedback (XAG 110)
Vestibular Sensitivity	<ul style="list-style-type: none">The presence of motion blurObvious or frequent camera movementFrequent changes in camera angleThe presence of moving, scrolling, or other animated content	<ul style="list-style-type: none">Provide players options to disable visual distractions like moving and scrolling content, especially when text is present (XAG 117)Provide players an option to disable display and camera options that may induce motion sickness or nausea
Situational and Temporary Factors Impacting Sensation and Perception	<ul style="list-style-type: none">Environmental influences that impact the way a player perceives the intensity of game stimuliPain flare ups, temporarily illnesses that exacerbate pain levels, induce nausea, migraines, etc.	<ul style="list-style-type: none">Support audio customization of different classes of sounds (XAG 105)Allow players to choose the color of key game elements (XAG 102)Provide players options to disable visual distractions, especially when text is present (XAG 117)Provide players an option to “darken” or simplify the background of a game if possible (XAG 102)Provide players with an option to customize the intensity of their controller’s haptic feedback (XAG 110)Provide players an option to disable display and camera options that may induce motion sickness or nausea

Photosensitive Epilepsy and Gaming		
	Barriers	Facilitators
Photosensitivity Epilepsy	<ul style="list-style-type: none">• The presence of flashing content under specified conditions• The presence of rolling or flickering elements on screen• The presence of visual patterns or geometric shapes with two highly contrasting colors• Player proximity to their screen or device	<ul style="list-style-type: none">• Reduce contrast between the brightest and darkest points of the flash (XAG 118)• Reduce flash frequency (XAG 118)• Decrease the size of flashing content (XAG 118)• Reduce contrast between pattern bands (XAG 118)• Reduce the size of the pattern (XAG 118)• Provide player warnings about proximity to screen