

#WWDC18

Advances in Research and Care Frameworks

Session 205

Srinath Tupil Muralidharan, Health Engineer

Gabriel Blanco, Core Motion Engineer

Akshay Yadav, Health Engineer



ResearchKit



CareKit

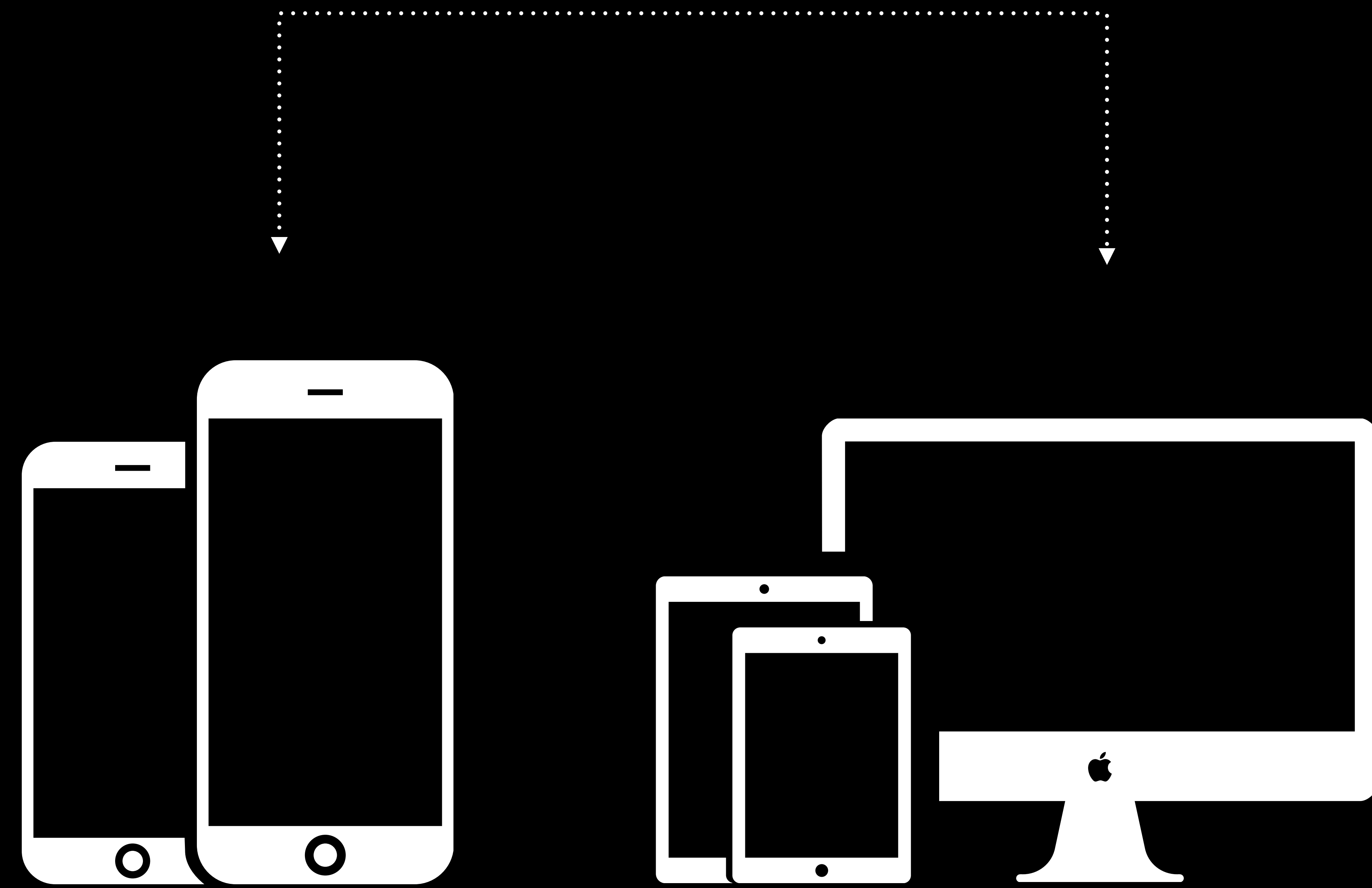


What's New in CareKit and ResearchKit

WWDC 2017

Connecting CareKit to the Cloud

WWDC 2017



What's New in CareKit and ResearchKit

WWDC 2017

Connecting CareKit to the Cloud

WWDC 2017



Penn Life Gained

Bariatric Surgery Apps








iPad 9:41 AM 100%

Active Patients Inactive Patients Actions

MWM (3) Pre-Operative 2 Weeks (0) Surgery (1) **Post-Operative 30 Days (5)** Post-Op Long Term (0)

Search

	Surgeon	Days Post-Op	Last Weight	Date of Weight	7 Day Calori
 Peters, Patty 30, Female	Noel N. Williams, MD	12	251 lb	10/3/17	383
 Plant, Robert A 12, Male	Daniel T. Dempsey, MD	6	--	--	--
 Ticket 115, Patient A 30, Male	Daniel T. Dempsey, MD	8	67 lb	9/25/17	--
 Ticket 127, Patient A 0, Male	Daniel T. Dempsey, MD	6	--	--	--
 Ticket 127, Patient A 0, Male	Daniel T. Dempsey, MD	6	--	--	--

9:41 AM 100%

Care Contents Today

S M T W T F S

October 25, 2017
Your care overview is 25% complete

TO DO

Weight
Weigh yourself every day >

Exercise Exercise for at least 10 minutes twice daily >

Physical Activity 10 minute physical activity twice... >

RECOMMENDATIONS

Attend Support Group...

Journey Care Contents Insights Resources Contacts

Health Frameworks



ResearchKit



CareKit



HealthKit

Research and Care



Research and Care



ResearchKit updates

Research and Care



ResearchKit updates

Movement Disorder API

Research and Care



ResearchKit updates

Movement Disorder API

Demo

ResearchKit Updates

Community

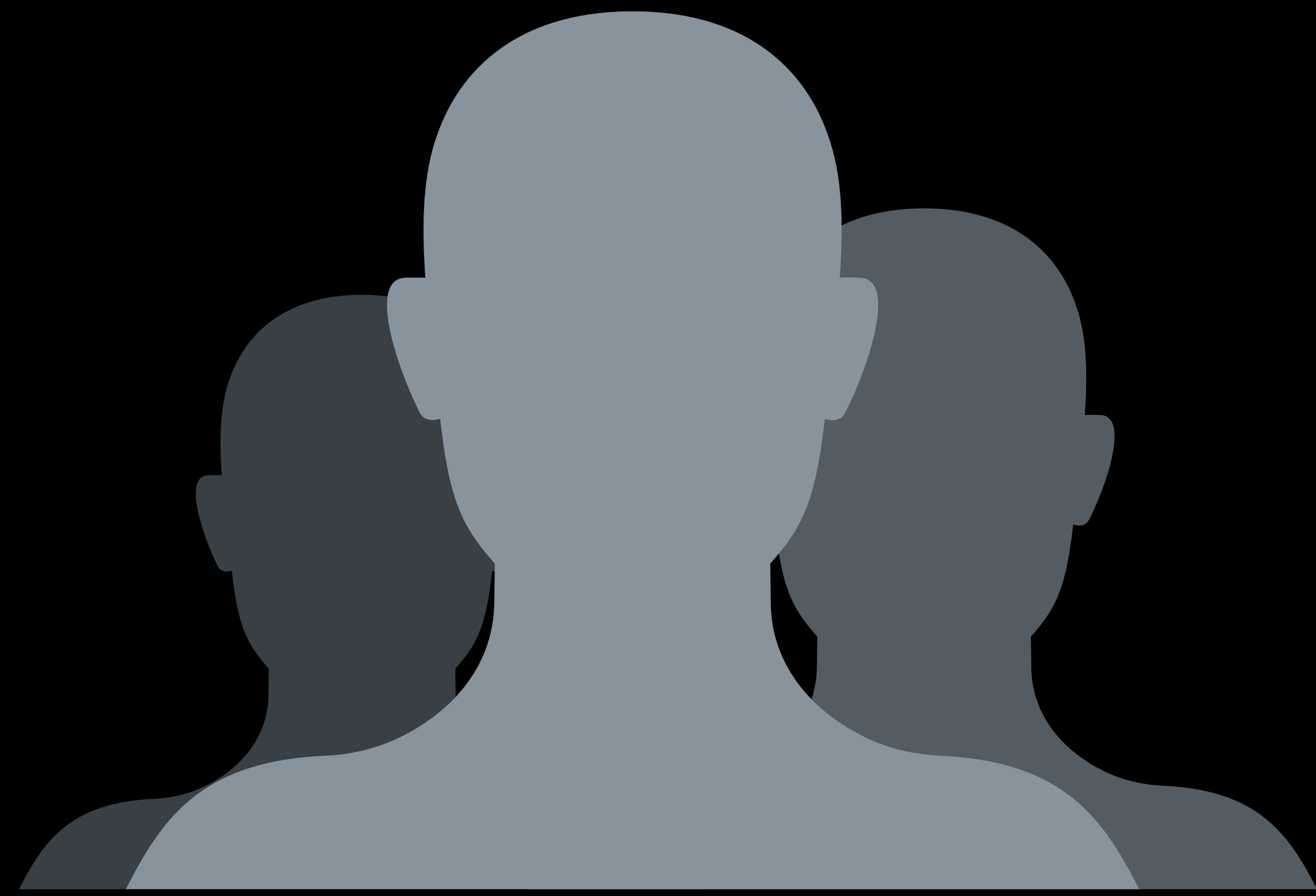
ResearchKit Updates

Community



ResearchKit Updates

UI improvements



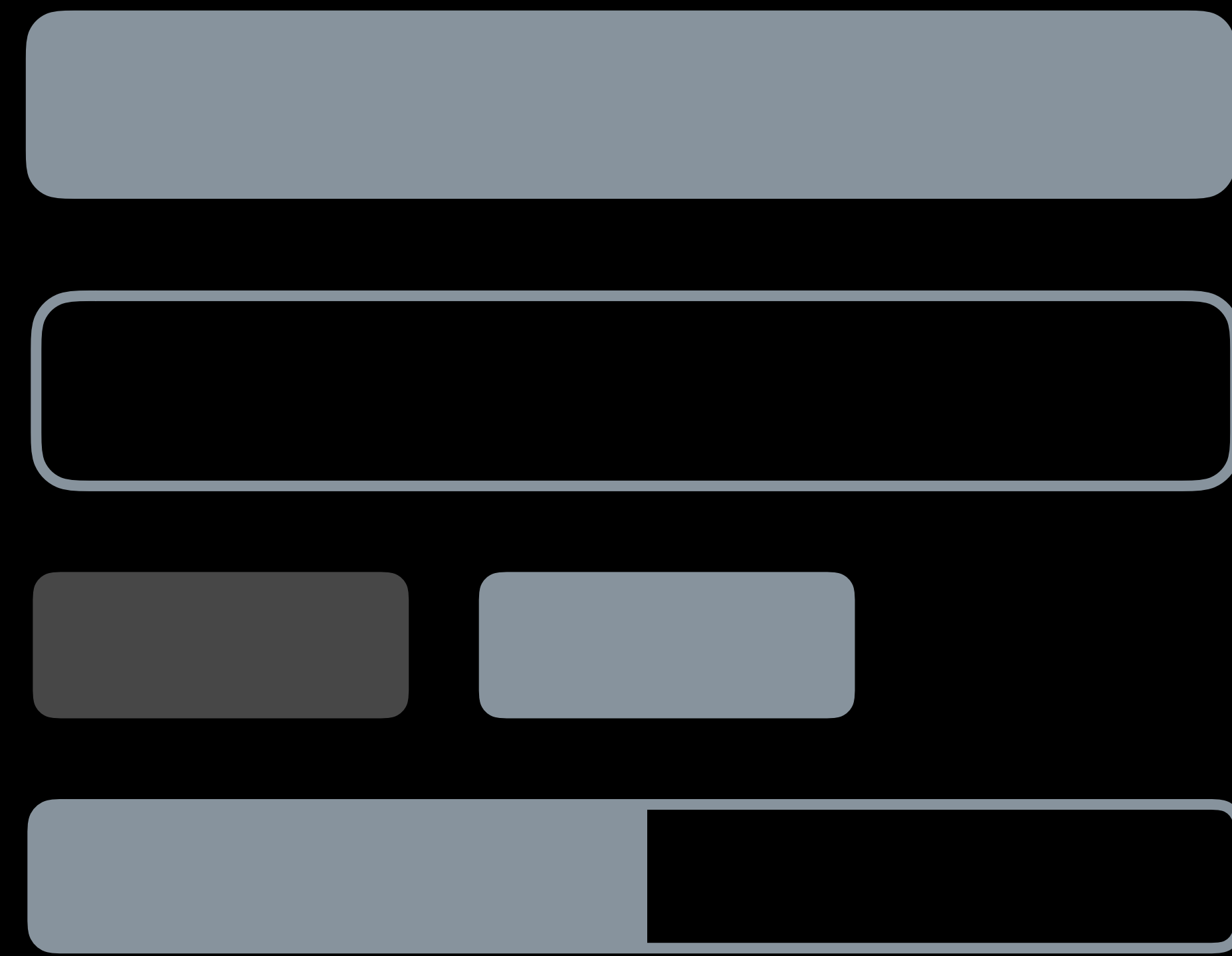
ResearchKit Updates

UI improvements



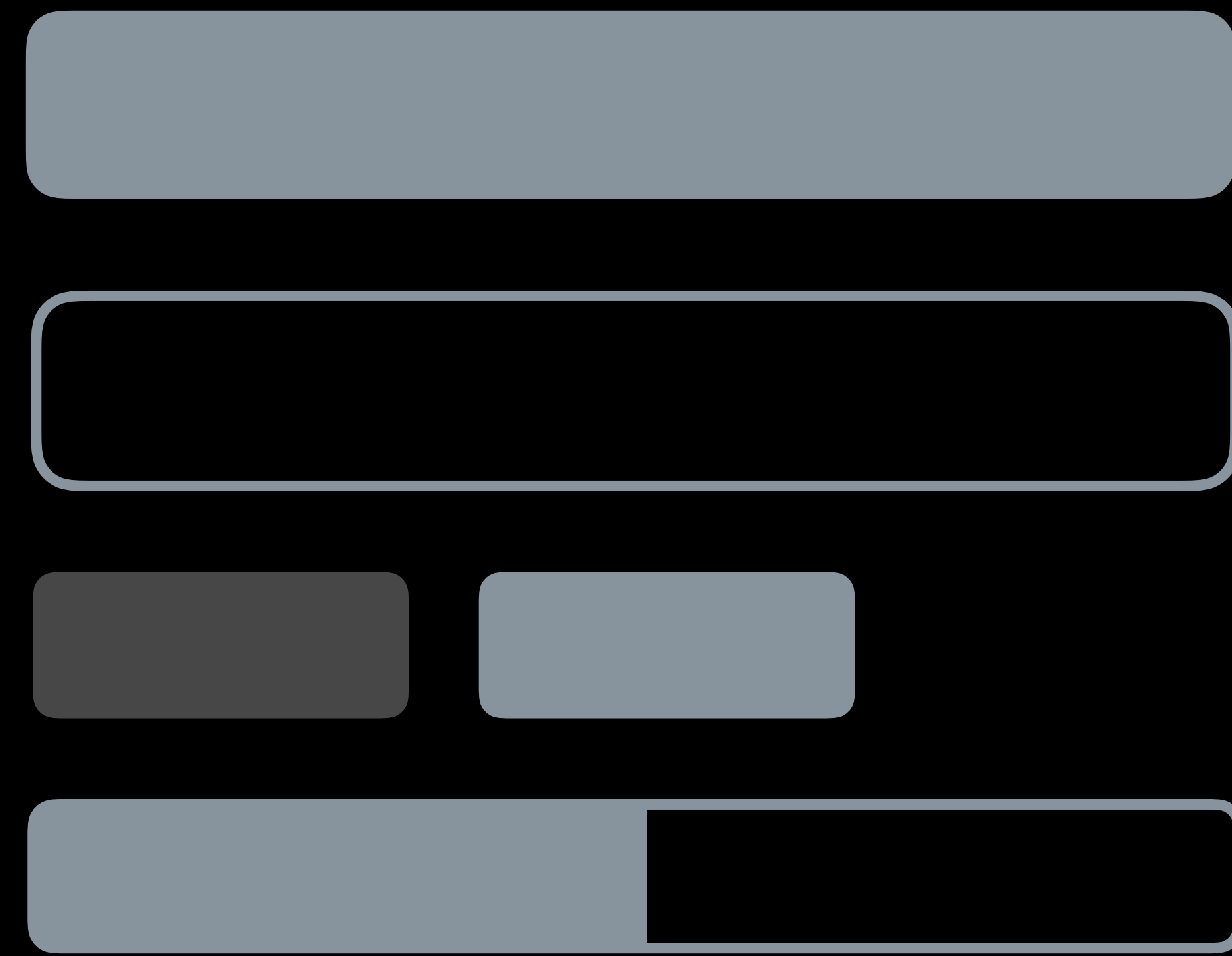
ResearchKit Updates

Active tasks



ResearchKit Updates

Active tasks



Community Updates

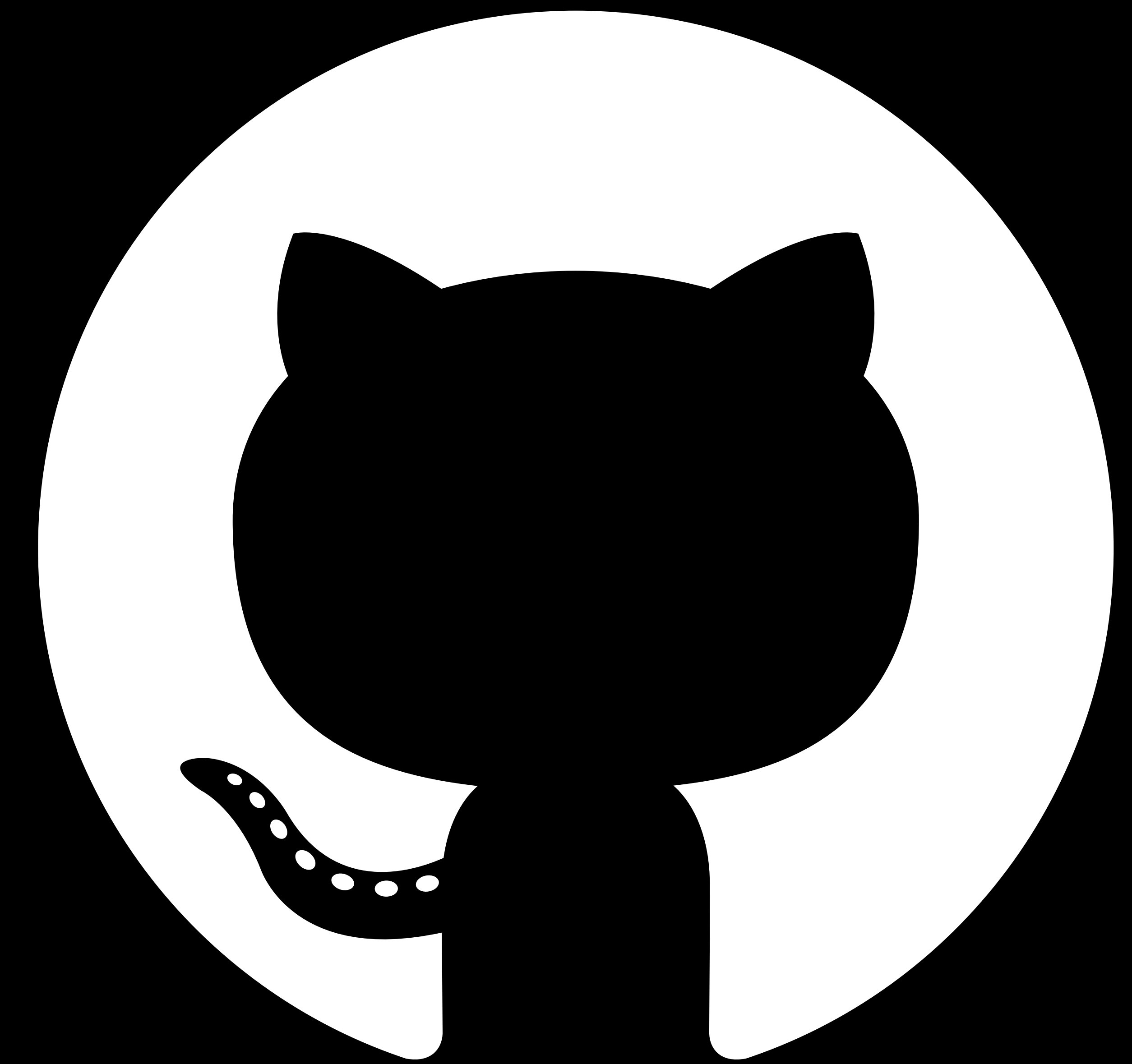
Repository Privileges

Expanded GitHub privileges

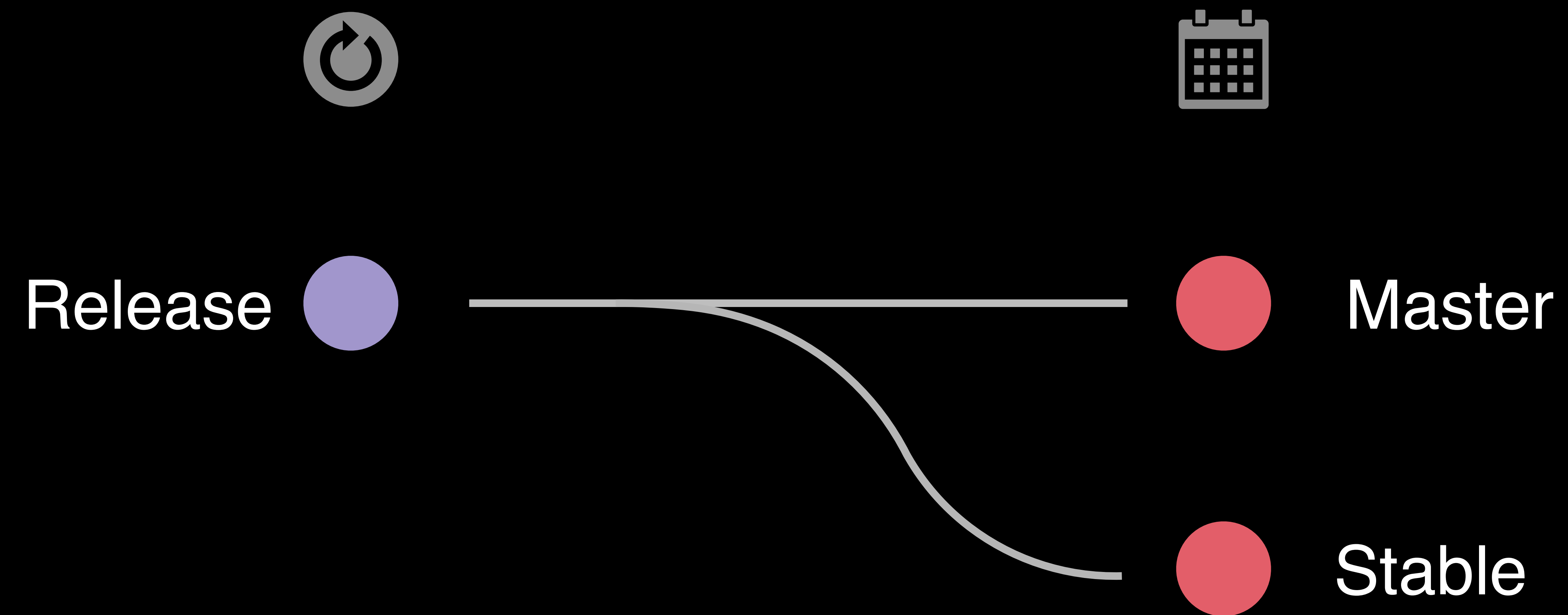
- Direct write access to the repository
- Merge in PRs

Community Members

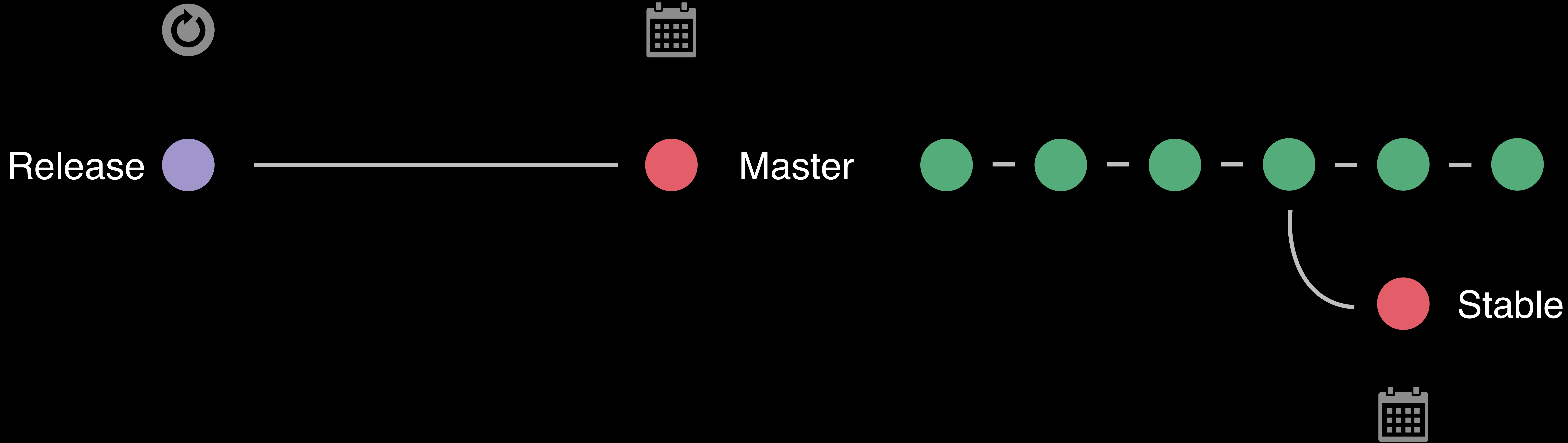
- Erin, Fernando, Nino, Ricardo, and Shannon



Release Schedule Updates



Release Schedule Updates



NEW

UI Updates

ResearchKit 1.5
Mini Form

9:41 Signal Wi-Fi Battery

< Step 3 of 5 Cancel

Mini Form

Mini form groups multi-entry in one page

BASIC INFORMATION

Blood Type B+

Date of Birth 2/28/1989

Weight 165 lb

DO YOU HAVE A HEADACHE?

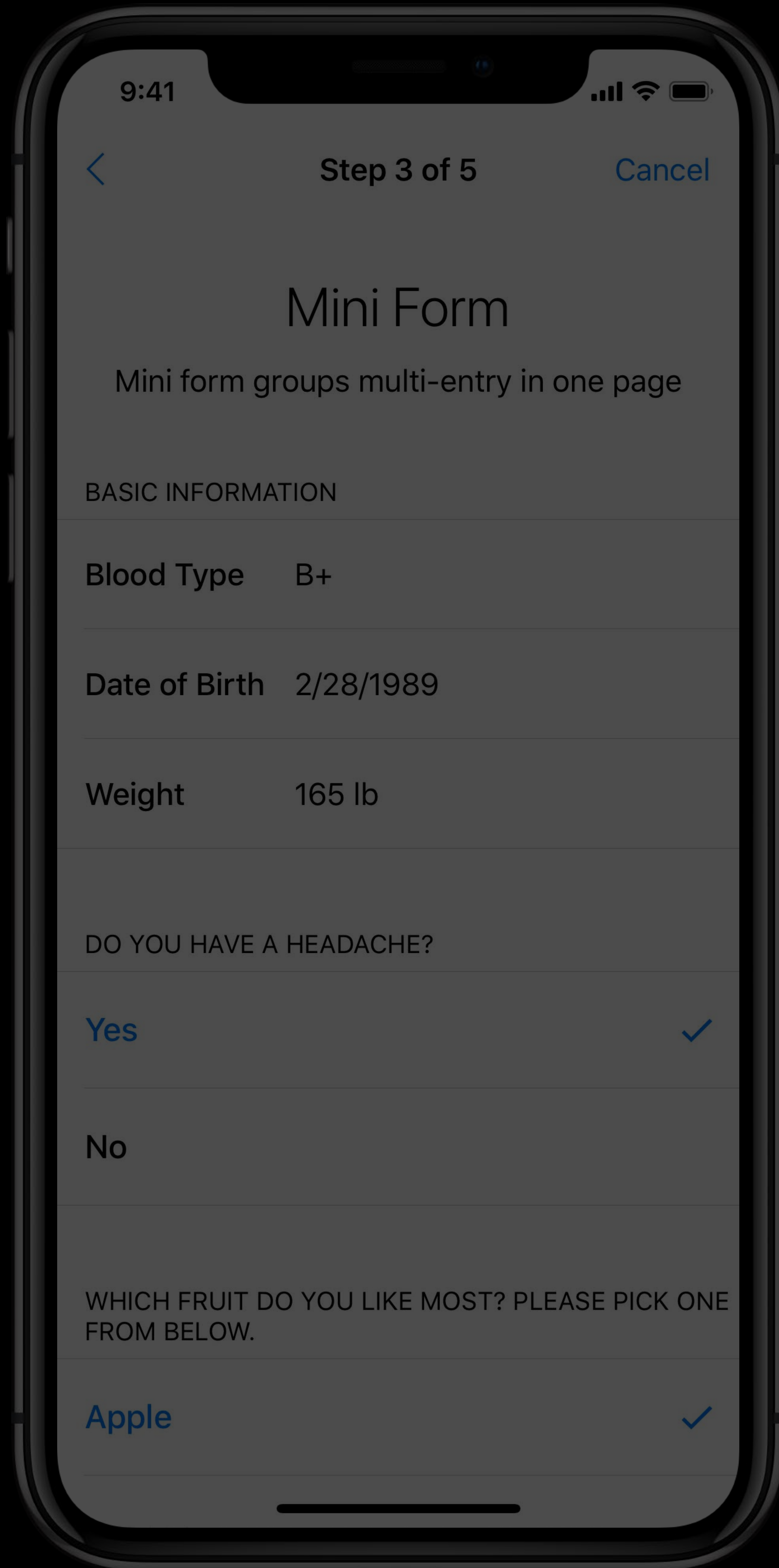
Yes ✓

No

WHICH FRUIT DO YOU LIKE MOST? PLEASE PICK ONE FROM BELOW.

Apple ✓

ResearchKit 1.5
Mini Form



9:41

Step 3 of 5 Cancel

Mini Form

Mini form groups multi-entry in one page

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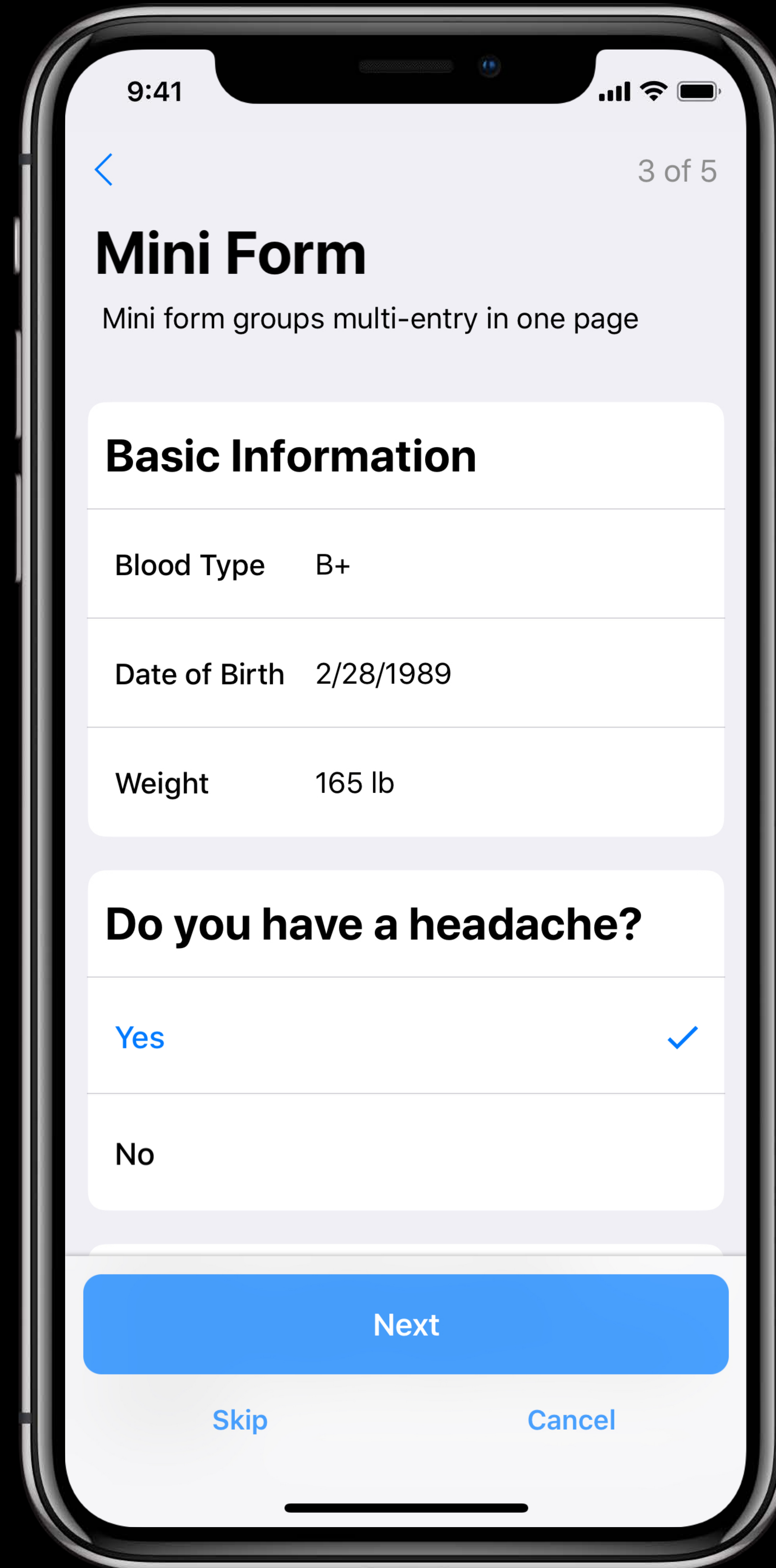
Yes ✓

No

WHICH FRUIT DO YOU LIKE MOST? PLEASE PICK ONE FROM BELOW.

Apple ✓

ResearchKit 2.0
Mini Form



9:41

3 of 5

Mini Form

Mini form groups multi-entry in one page

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Do you have a headache?

Yes ✓

No

Next

Skip Cancel

9:41



3 of 5

Mini Form

Mini form groups multi-entry in one page

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Do you have a headache?

9:41



3 of 5

Mini Form

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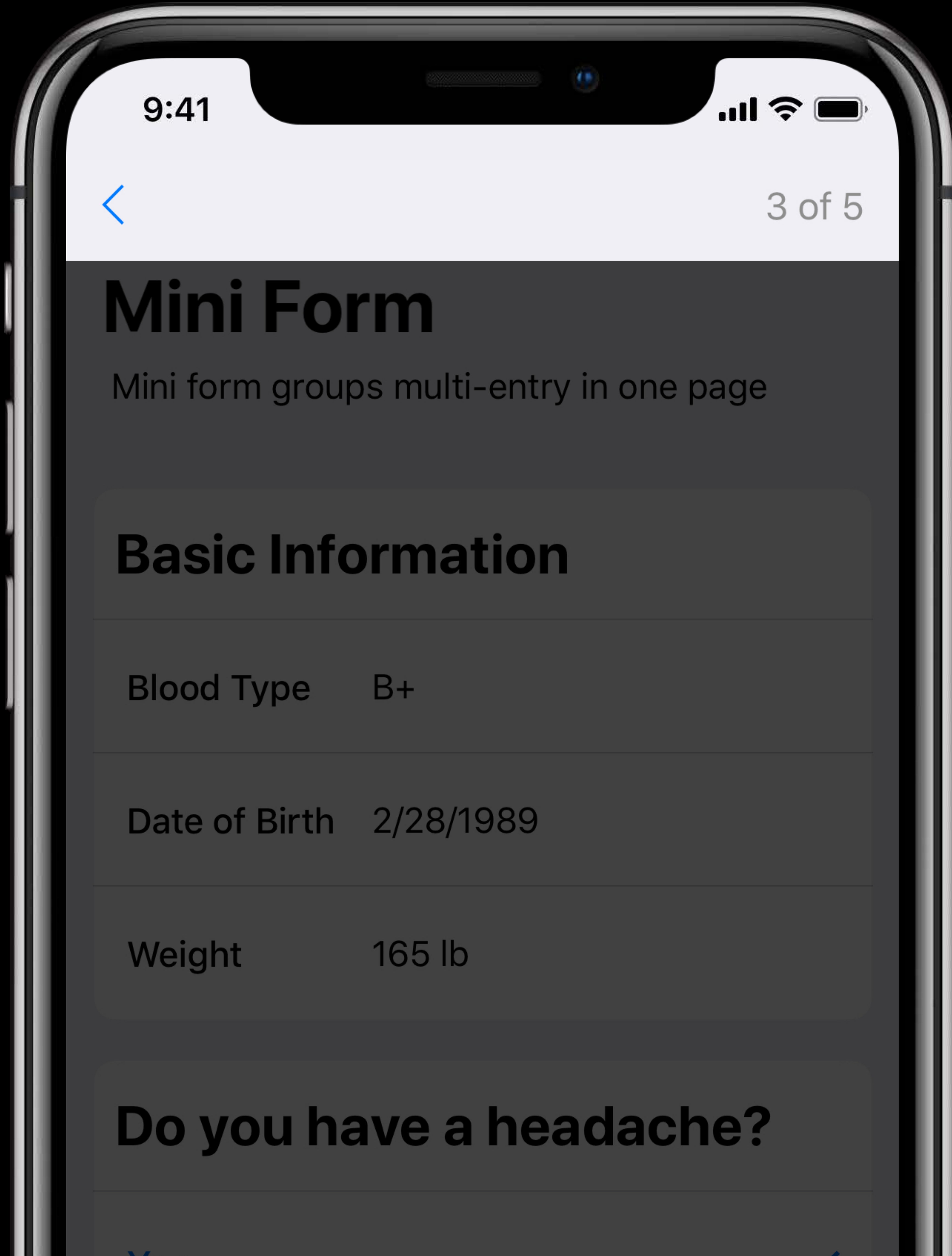
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Weight 165 lb

Do you have a headache?



Progress Label
Right side of Navigation

9:41



3 of 5

Mini Form

Mini form groups multi-entry in one page

Basic Information

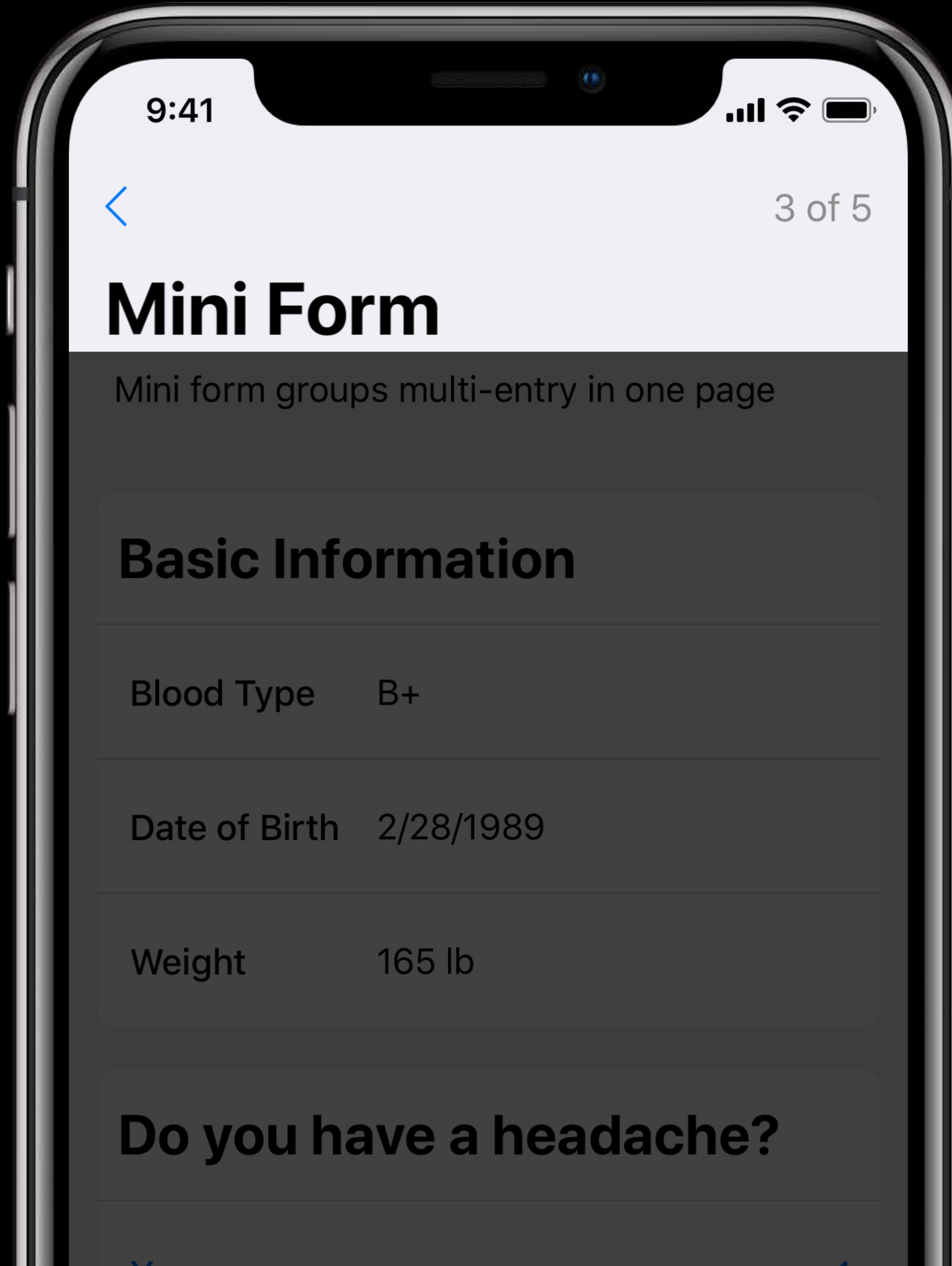
Blood Type B+

Date of Birth 2/28/1989

Weight 165 lb

Do you have a headache?

Large Titles
Navigation Item



9:41



3 of 5

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Mini form groups multi-entry in one page

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Do you have a headache?

9:41



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—● Card View
Survey Items

Do you have a headache?

9:41



3 of 5

Mini Form

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Do you have a headache?

Blood Type B+

Date of Birth 2/28/1989

Weight 165 lb

Do you have a headache?

Yes



No

Next

Skip

Cancel

Blood Type B+

Date of Birth 2/28/1989

Weight 165 lb

Do you have a headache?

Yes



No

Next

Skip

Cancel

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Date of Birth 2/28/1989

Weight 165 lb

Do you have a headache?

Yes



No

Next

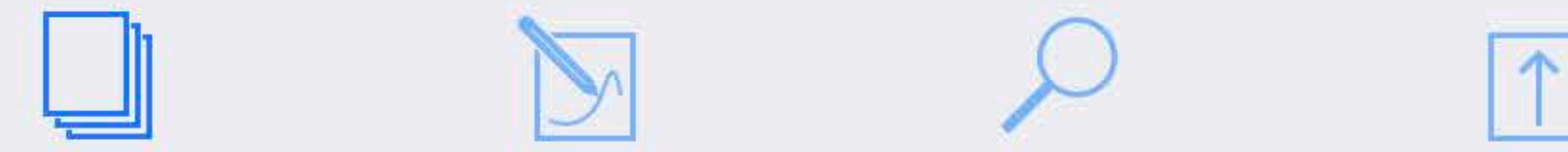
Skip

Cancel

Footer Container
Sticky to View



Consent Document



INFORMED CONSENT DOCUMENT

TITLE: Apple Heart Study: Assessment of Wristwatch-Based Photoplethysmography to Identify Cardiac Arrhythmias

PROTOCOL NUMBER: Apple Heart Study

SPONSOR: Apple Inc.

INVESTIGATORS: Mintu Turakhia, MD, MAS and Marco Perez, MD

24 HR. TELEPHONE: #1-844-606-1609

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NUMBER OF SUBJECTS / LENGTH OF PARTICIPATION

Approximately 500,000 participants may participate in this study. Your participation in this

Done

Cancel

PDFViewer
ORKStep

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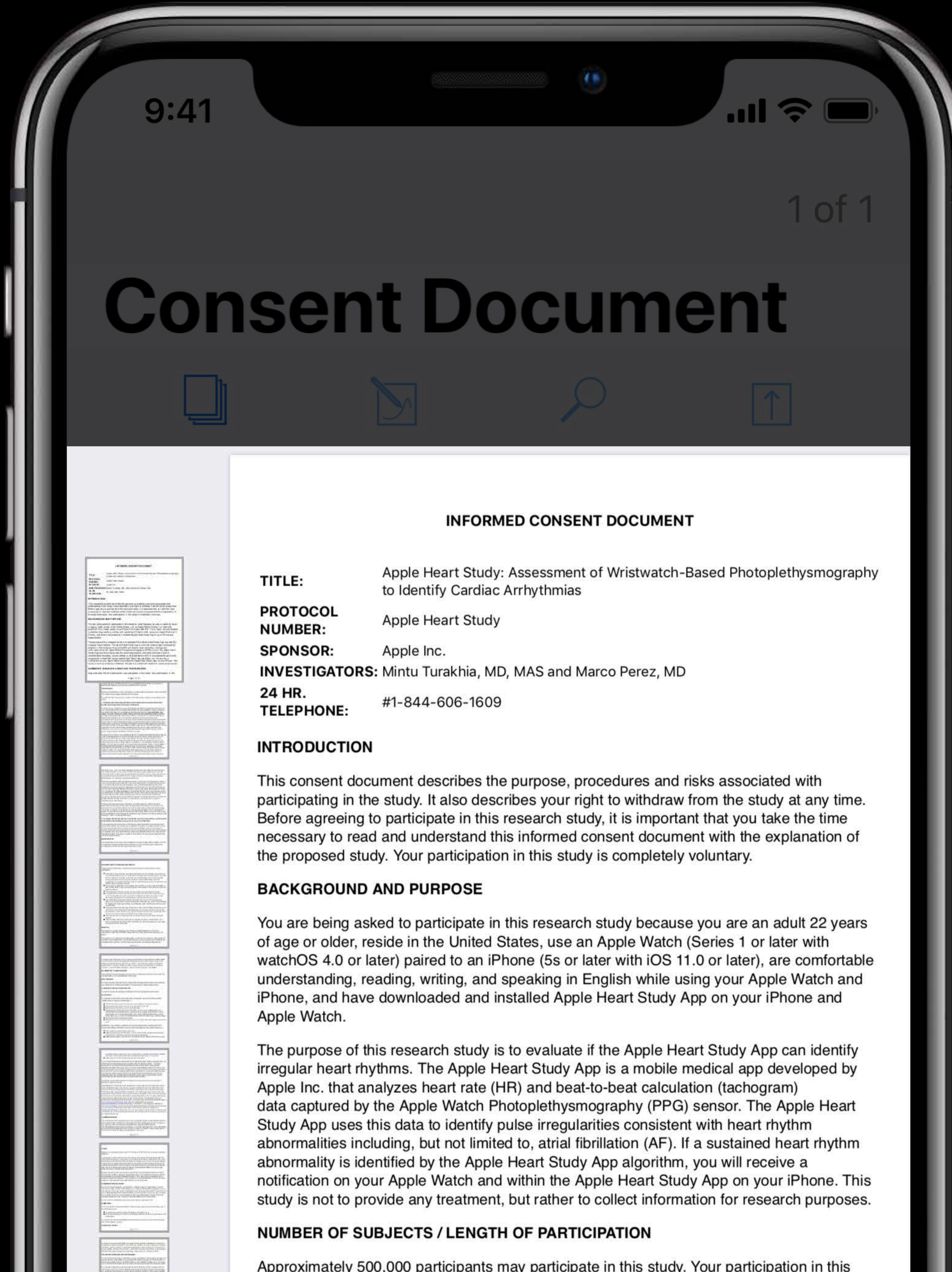
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Quick Navigation
Switch Between Pages



9:41



1 of 1

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Clear

Apply

X

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9:41



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X

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Annotation
Real Time

Consent Document



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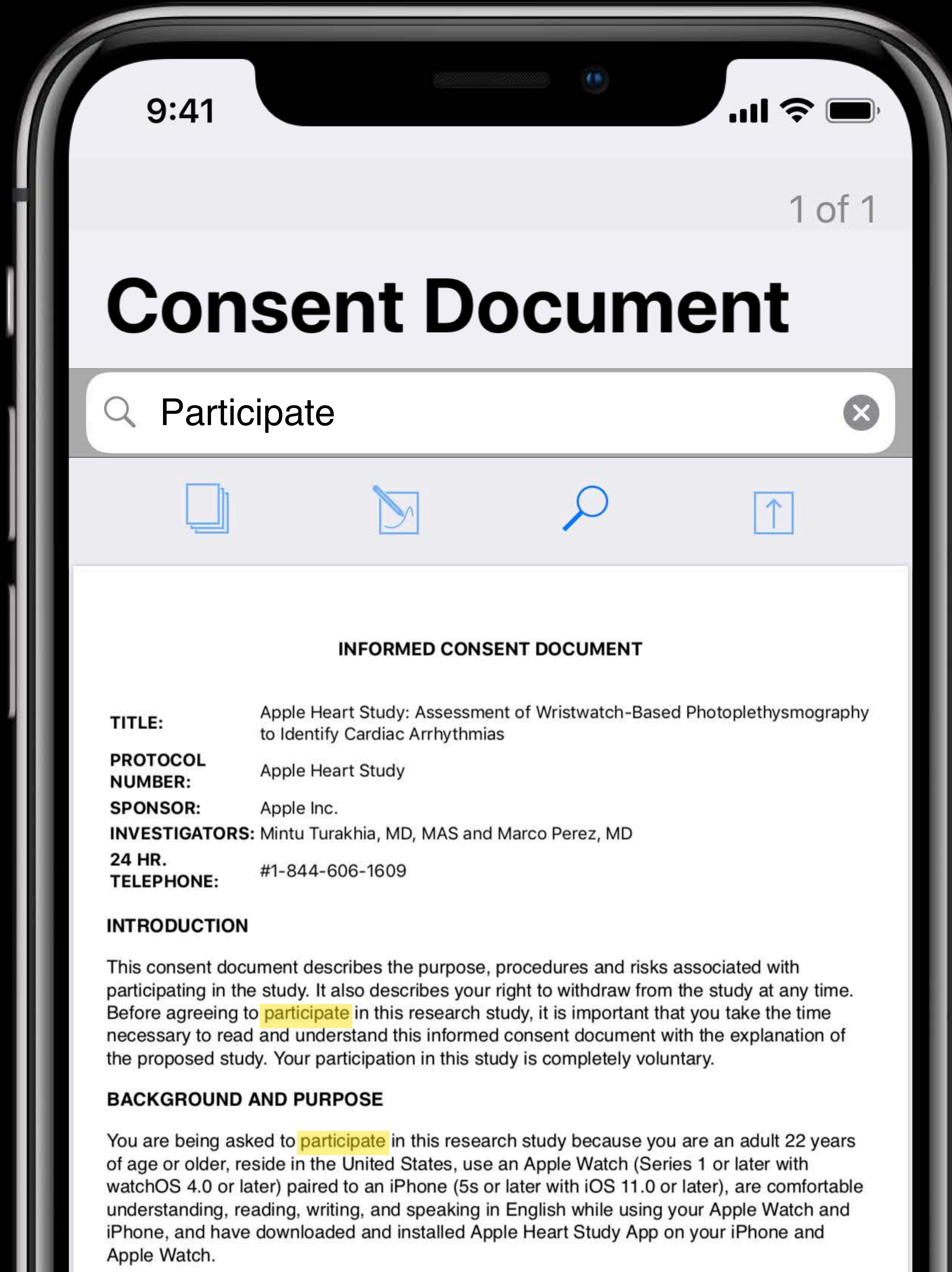
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Search
Entire Document



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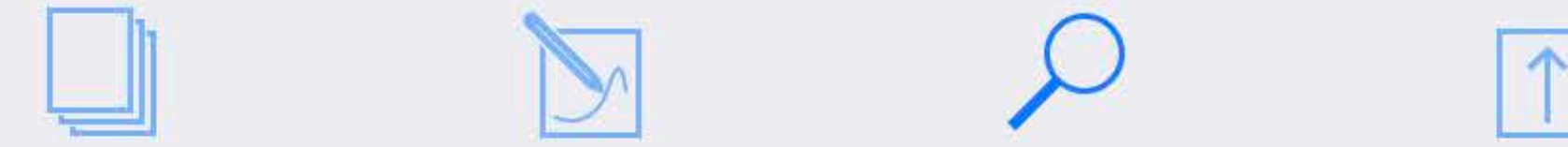
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Done

Cancel



Share
iOS Share Sheet


```
//PDF Viewer Step
```

```
import ResearchKit
```

```
let pdfViewerStep = ORKPDFViewerStep(identifier: "pdfViewerStep")
```

```
let pdfURL = Bundle.main.bundleURL.appendingPathComponent("consentDocument.pdf")
```

```
pdfViewerStep.title = "Consent Document"
```

```
pdfViewerStep.pdfURL = pdfURL
```

NEW

Active Tasks

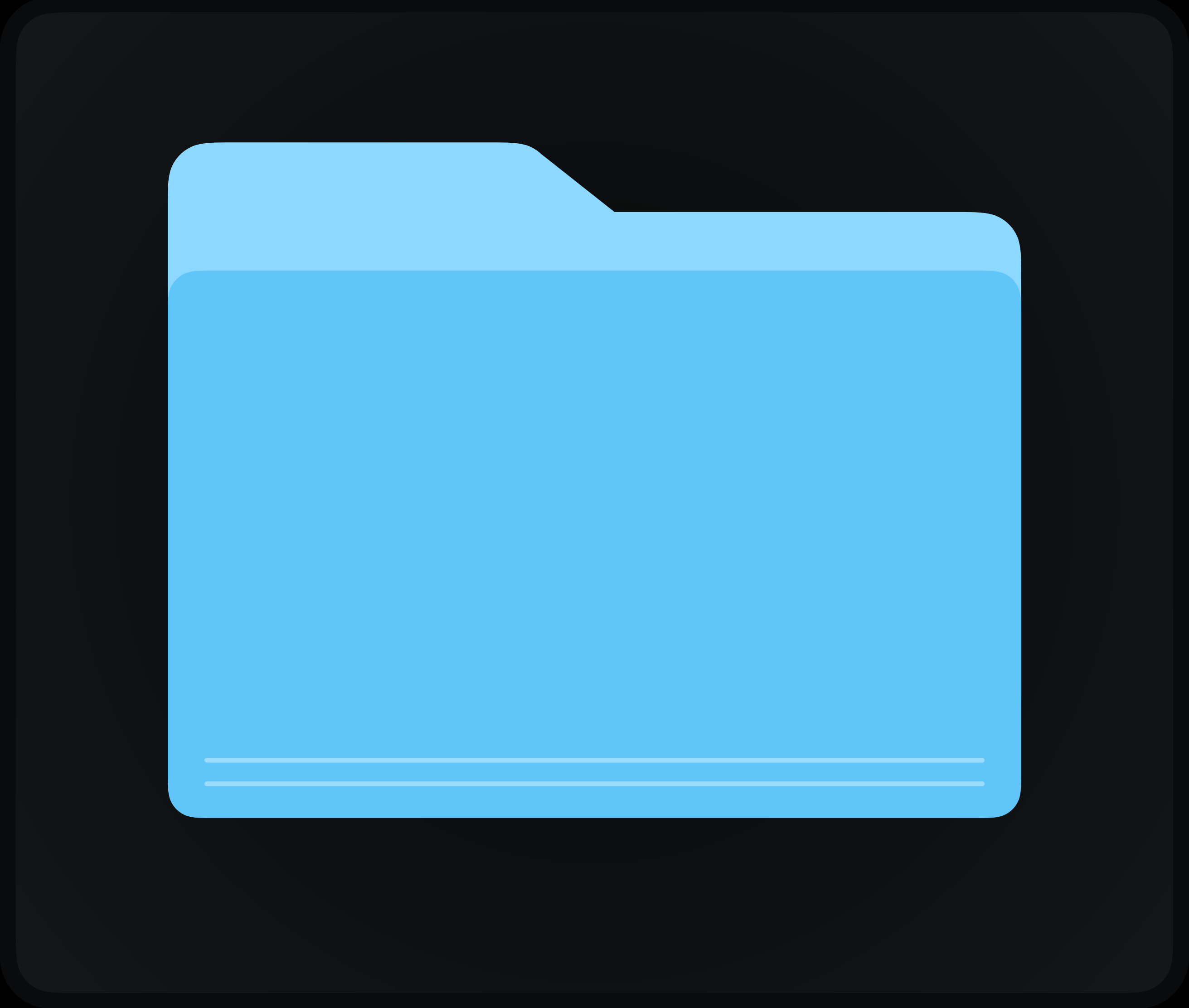
ORKResult
Data from Active Task

```
1 0 0 1 1 0 1 1 0 0
0 1 0 0 1 1 0 0 1 0
0 1 1 0 0 1 1 0 1 1
1 0 1 1 0 1 0 1 0 1
1 0 0 1 1 0 1 1 0 0
1 0 0 1 1 0 1 1 0 0
0 1 0 0 1 1 0 0 1 0
```

ORKResult
Data from Active Task



+



Health Records
Data from HealthKit API

```
//Active Step with Health Records Recorder
```

```
import HealthKit
```

```
import ResearchKit
```

```
var healthClinicalType: HKClinicalType!
```

```
var healthFHIRResourceType: HKFHIRResourceType?
```

```
let step = ORKShoulderRangeOfMotionStep(identifier: "rangeOfMotionStep", limbOptions: .left)
```

```
let config = ORKHealthClinicalTypeRecorderConfiguration(identifier: "medicationRecorder",  
                                                       healthClinicalType: healthClinicalType,  
                                                       healthFHIRResourceType: healthFHIRResourceType)
```

```
step.recorderConfigurations = [config]
```

```
//Active Step with Health Records Recorder
```

```
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```

```
import ResearchKit
```

```
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```

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```

```
let step = ORKShoulderRangeOfMotionStep(identifier: "rangeOfMotionStep", limbOptions: .left)
```

```
let config = ORKHealthClinicalTypeRecorderConfiguration(identifier: "medicationRecorder",  
                                                       healthClinicalType: healthClinicalType,  
                                                       healthFHIRResourceType: healthFHIRResourceType)
```

```
step.recorderConfigurations = [config]
```

```
//Active Step with Health Records Recorder
```

```
import HealthKit
```

```
import ResearchKit
```

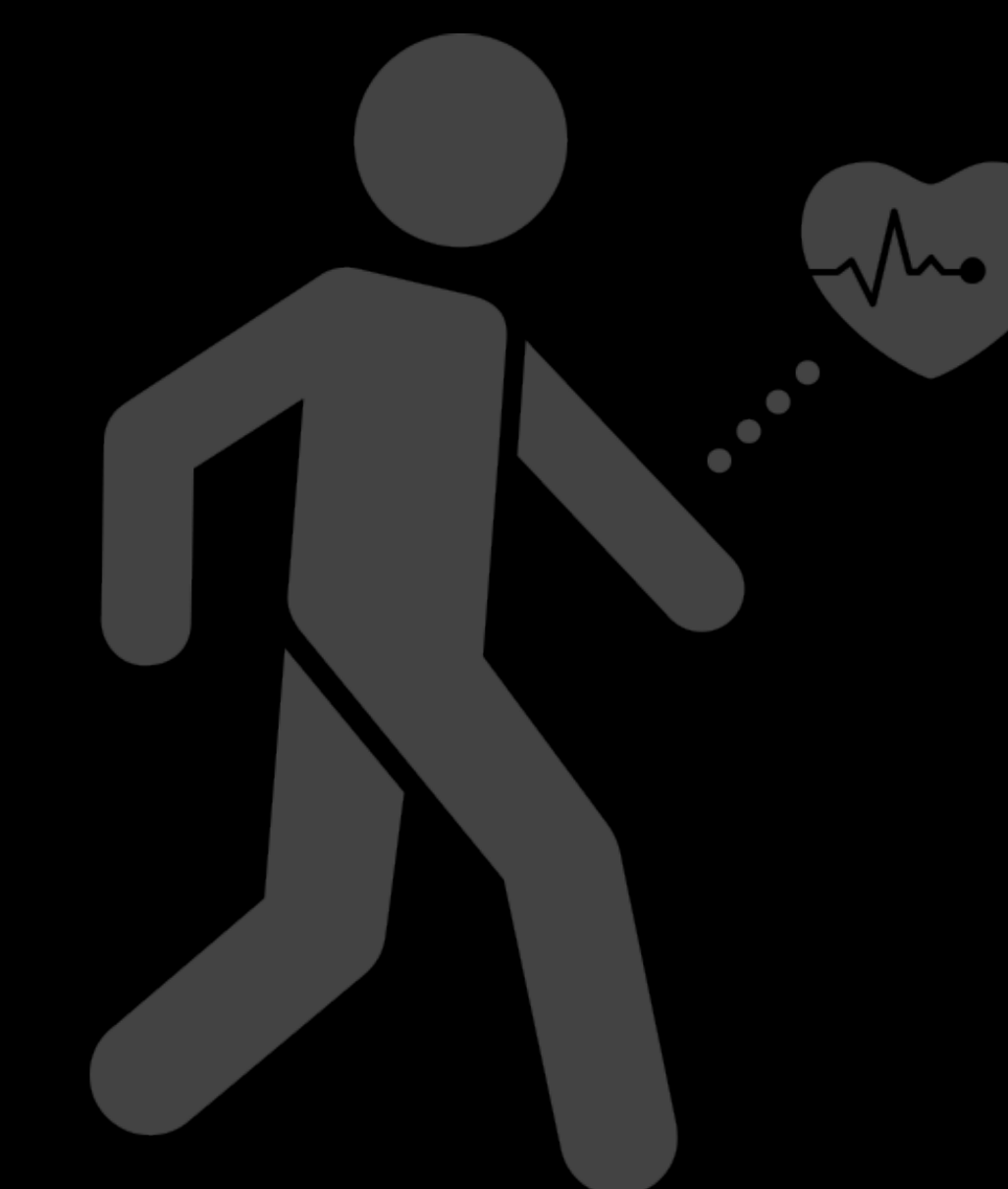
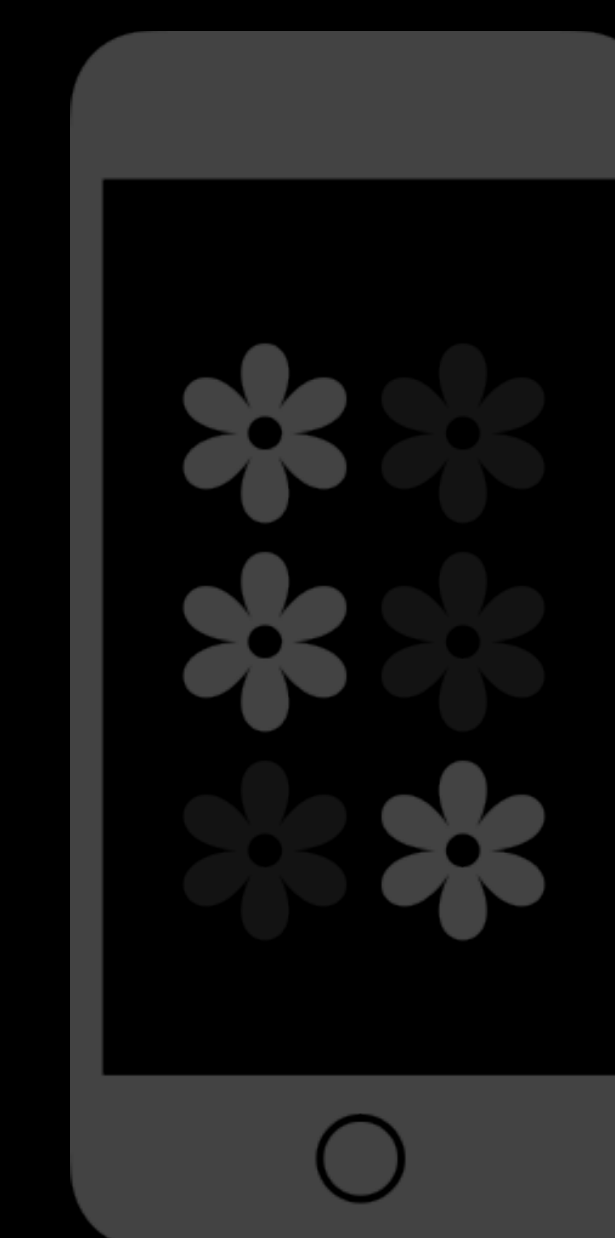
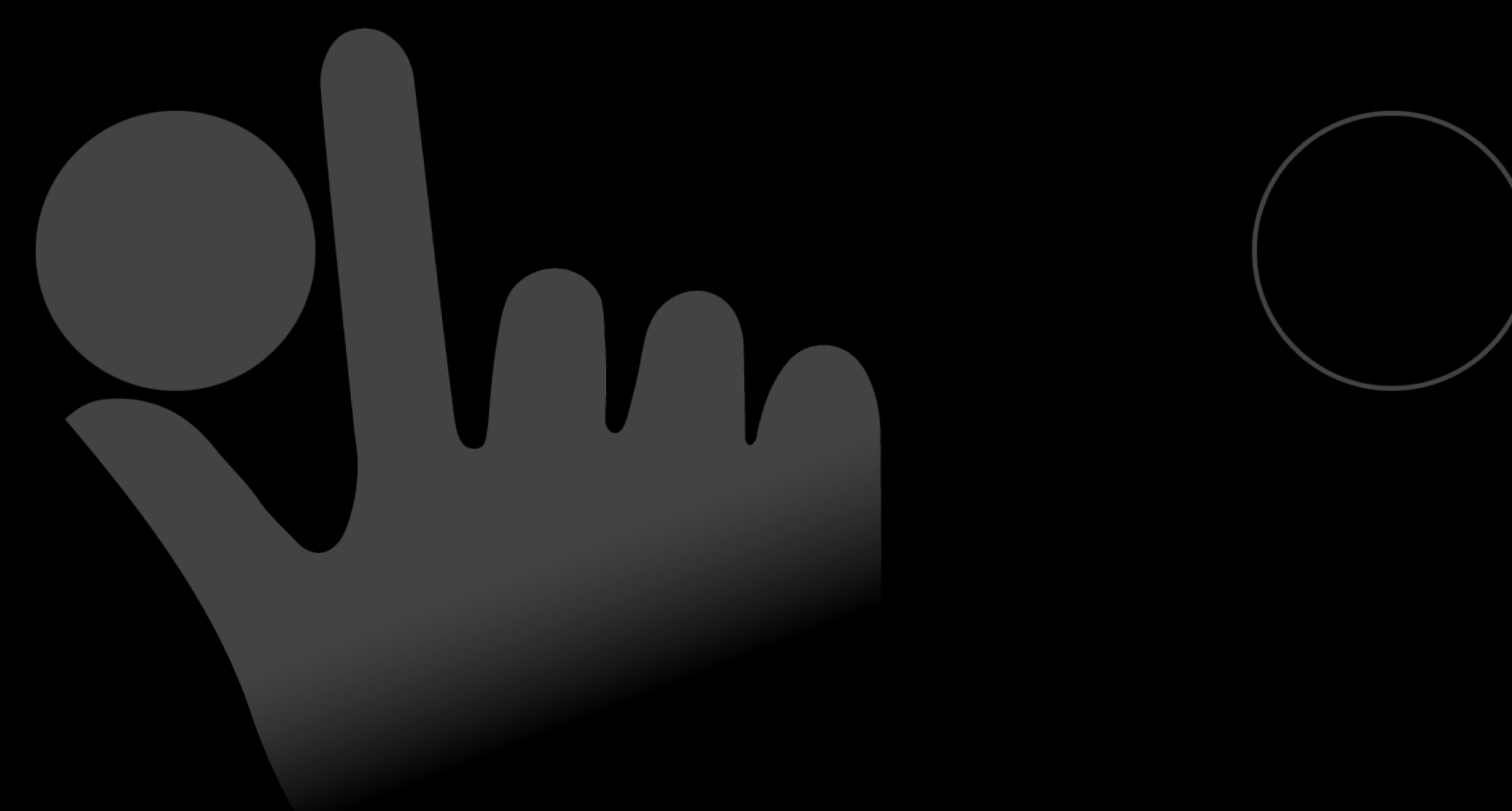
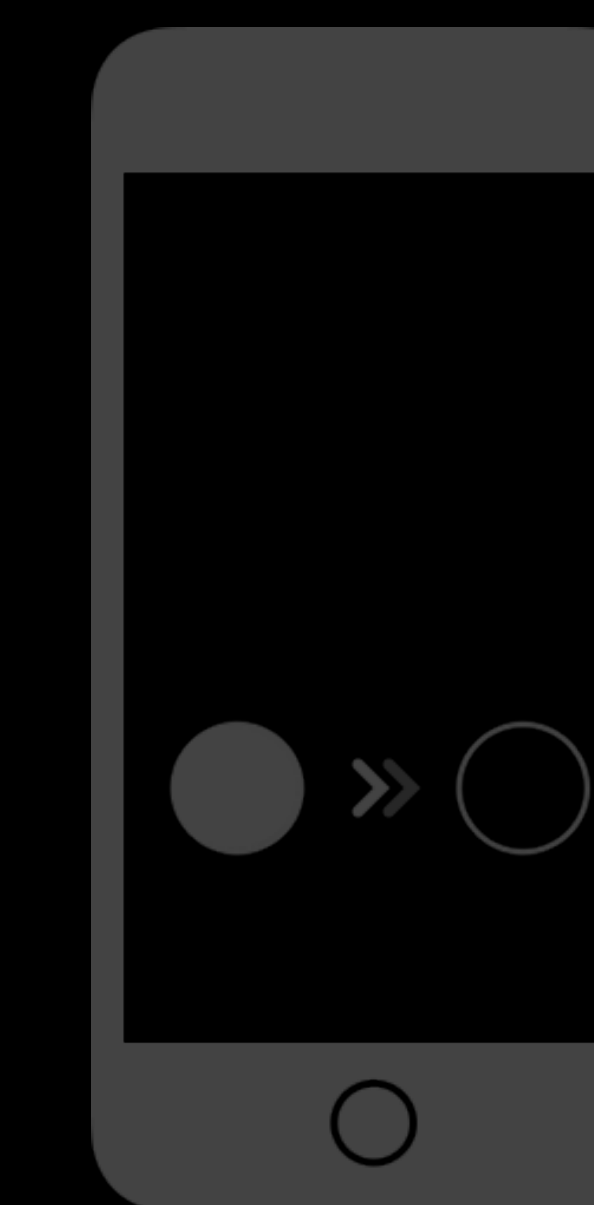
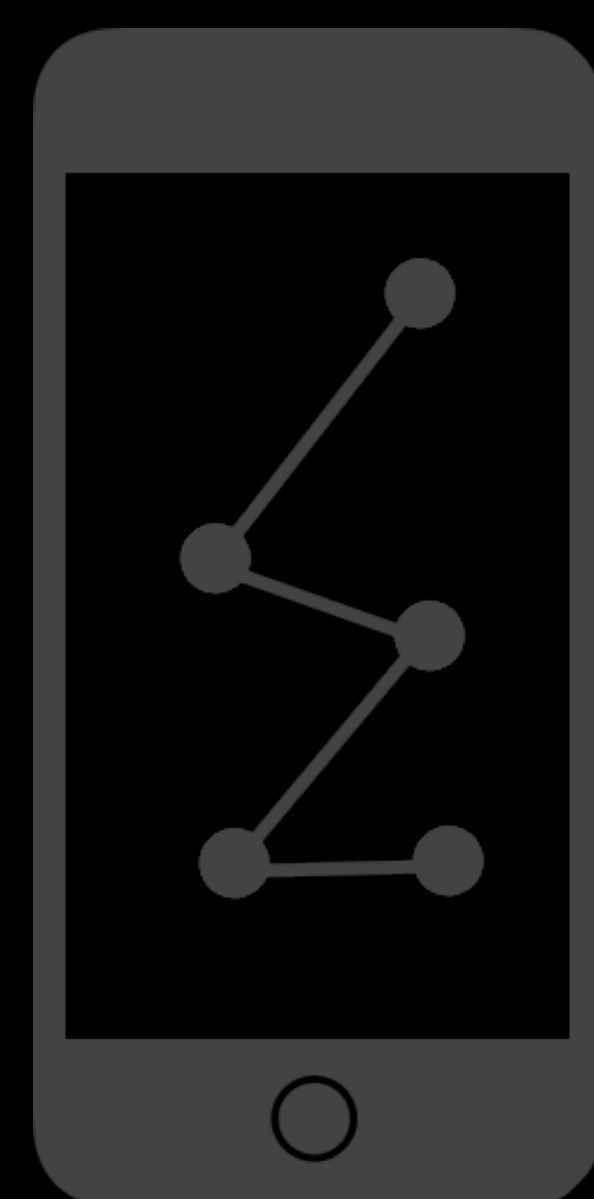
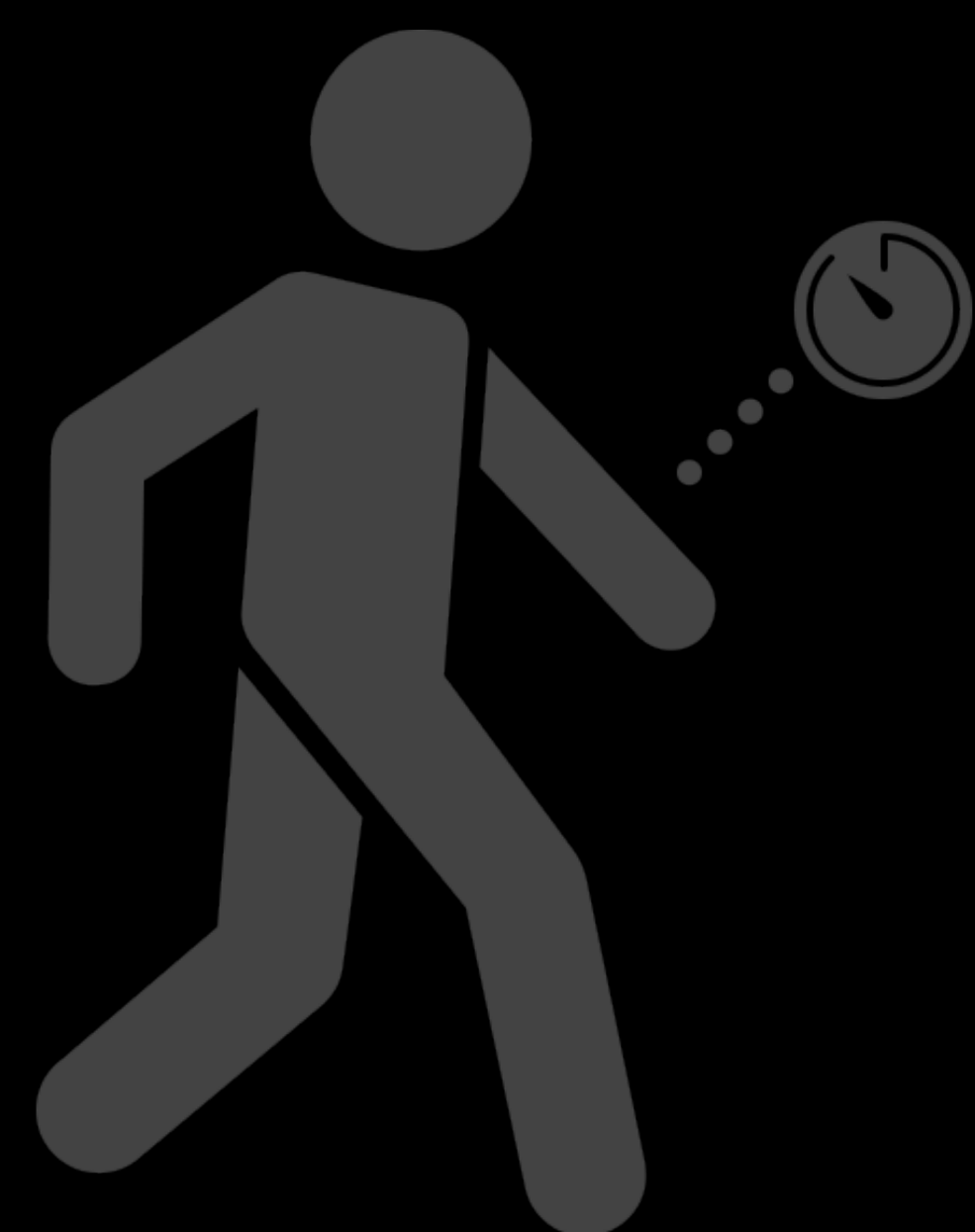
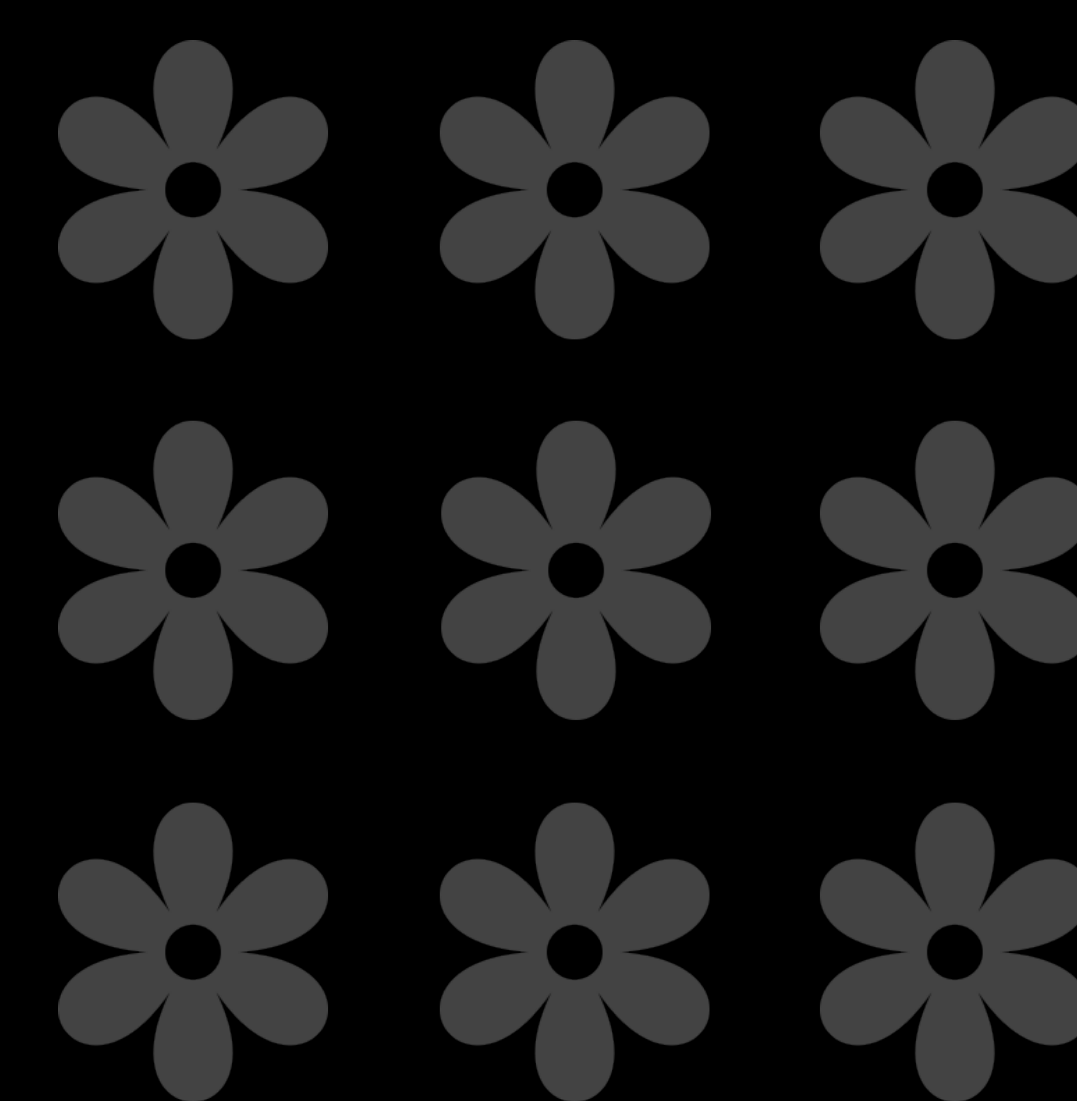
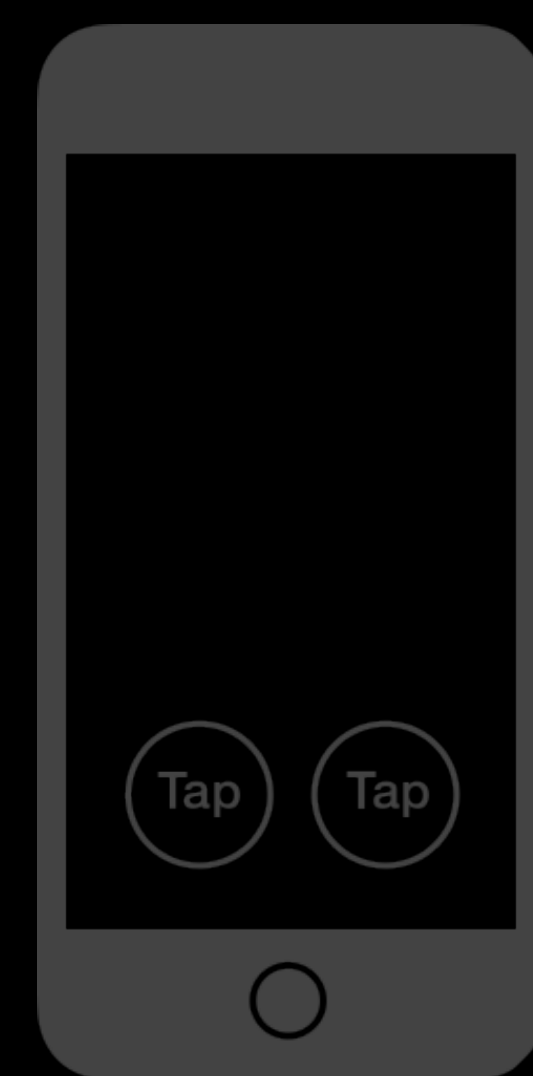
```
var healthClinicalType: HKClinicalType!
```

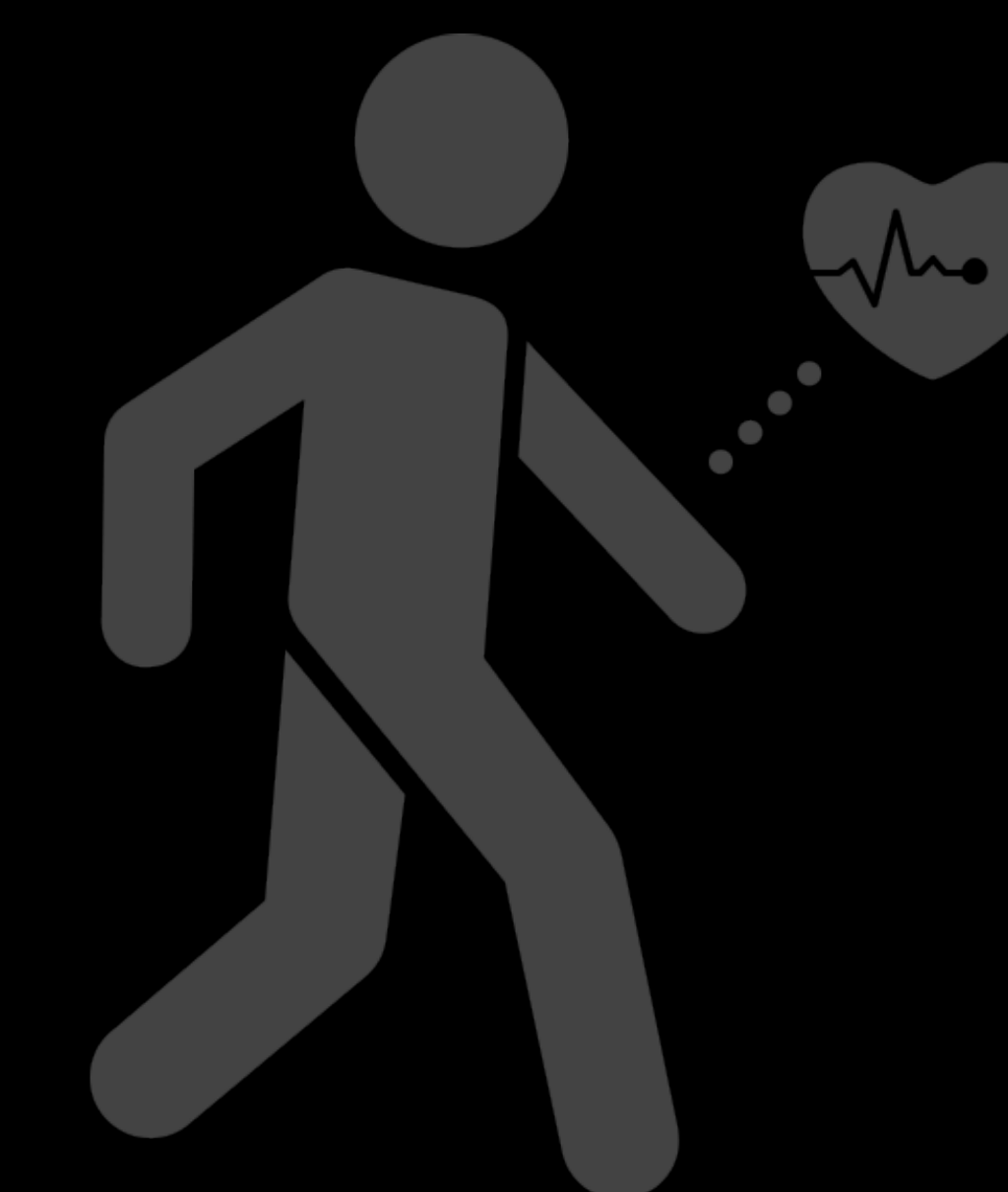
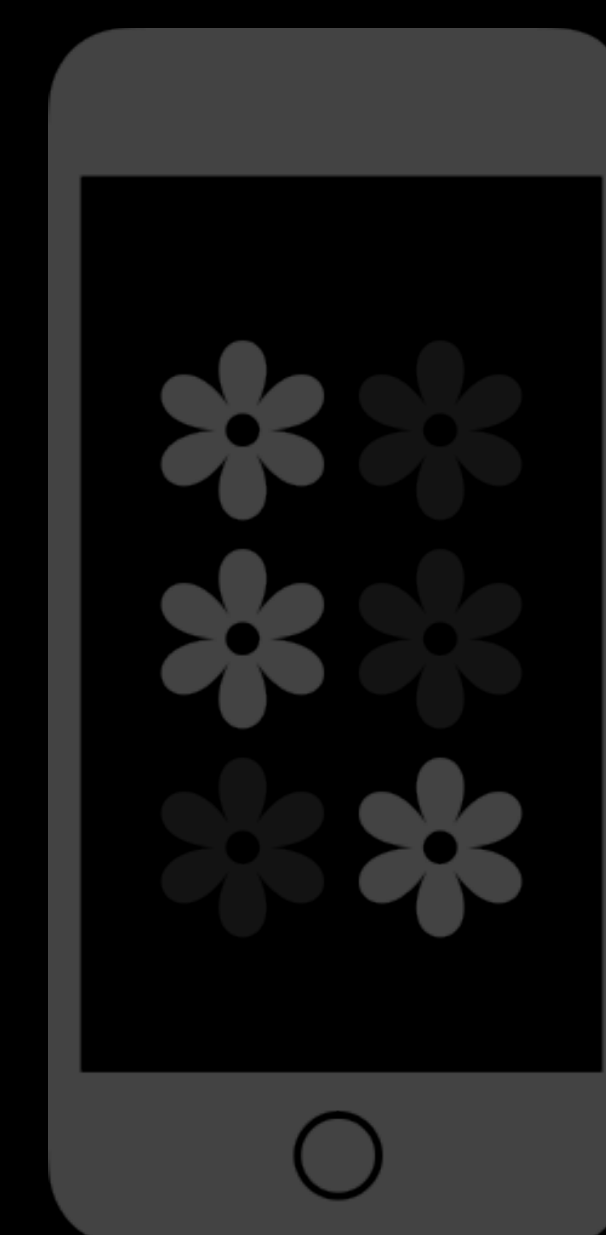
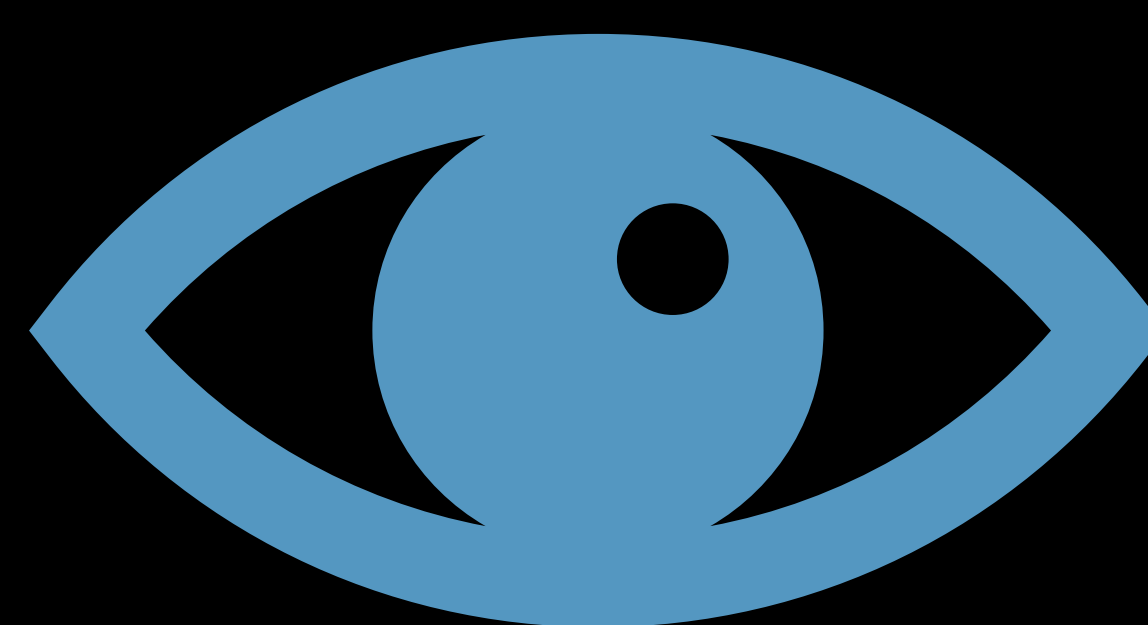
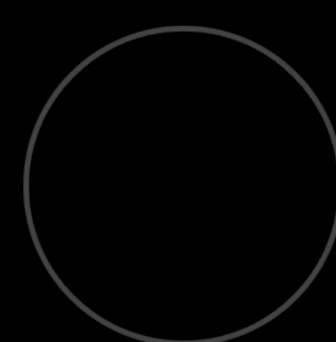
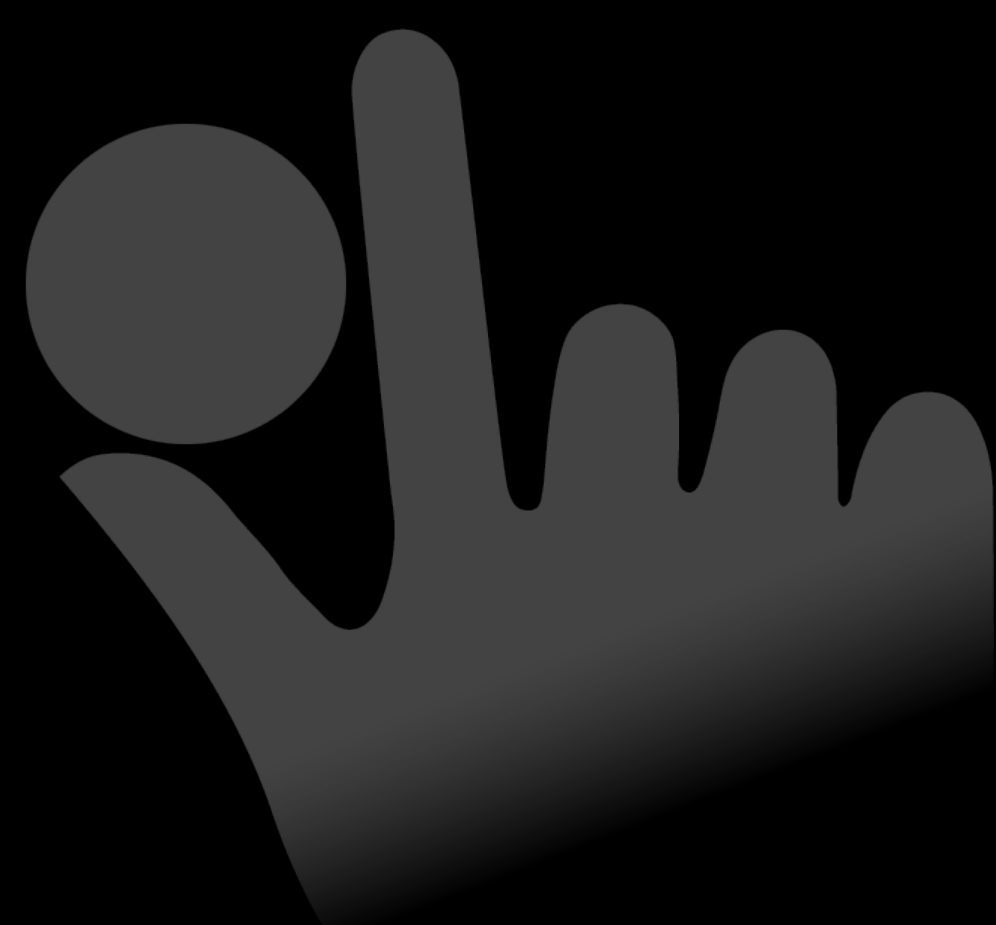
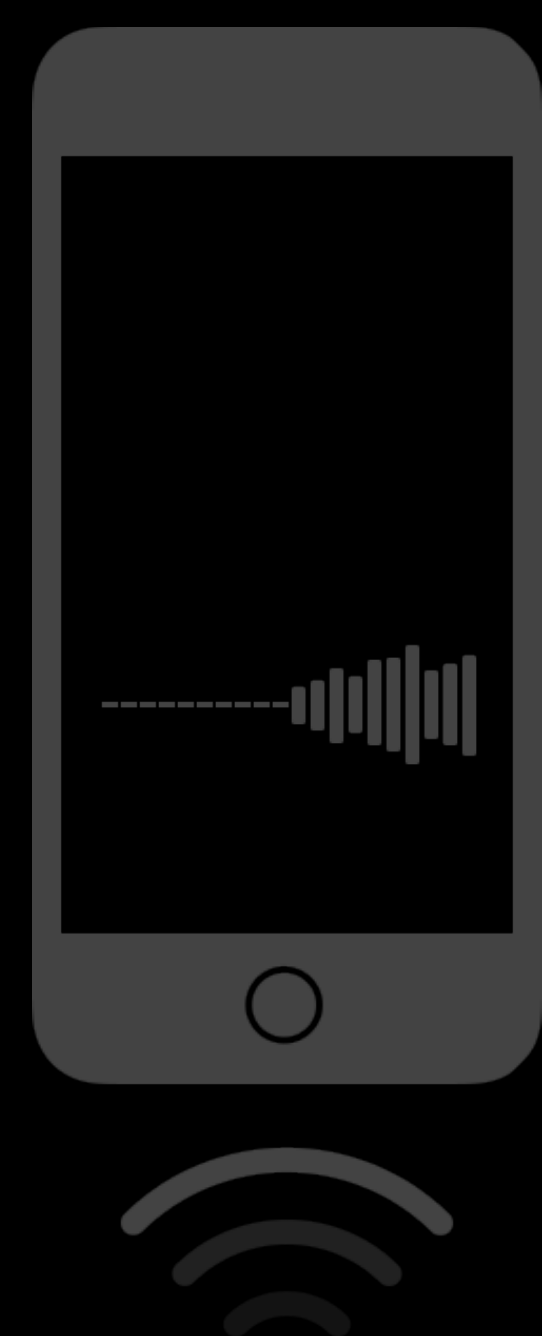
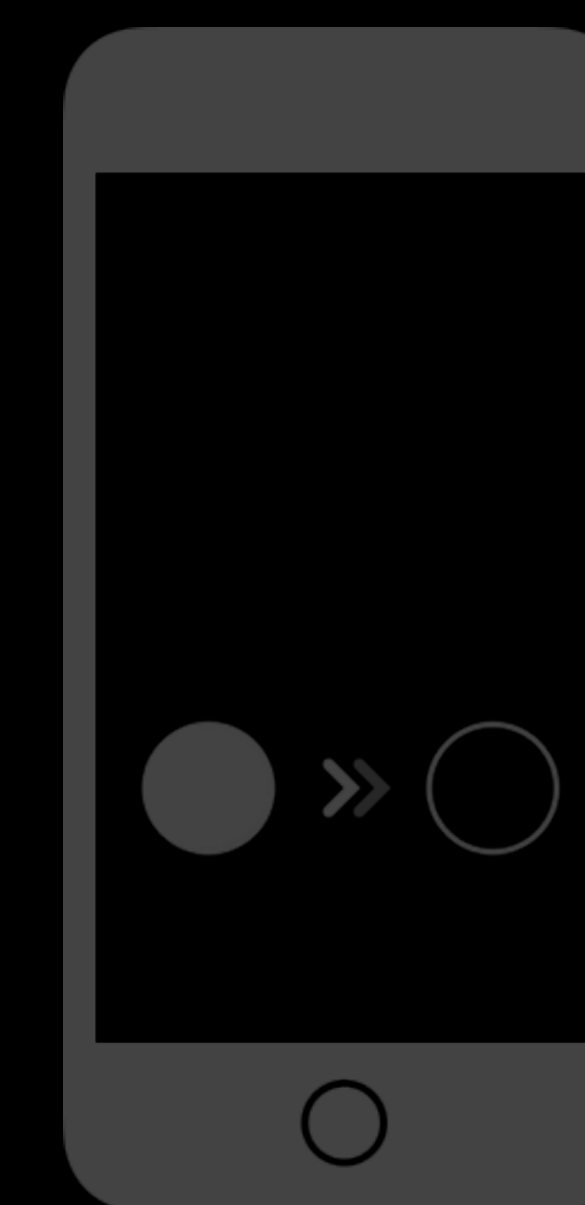
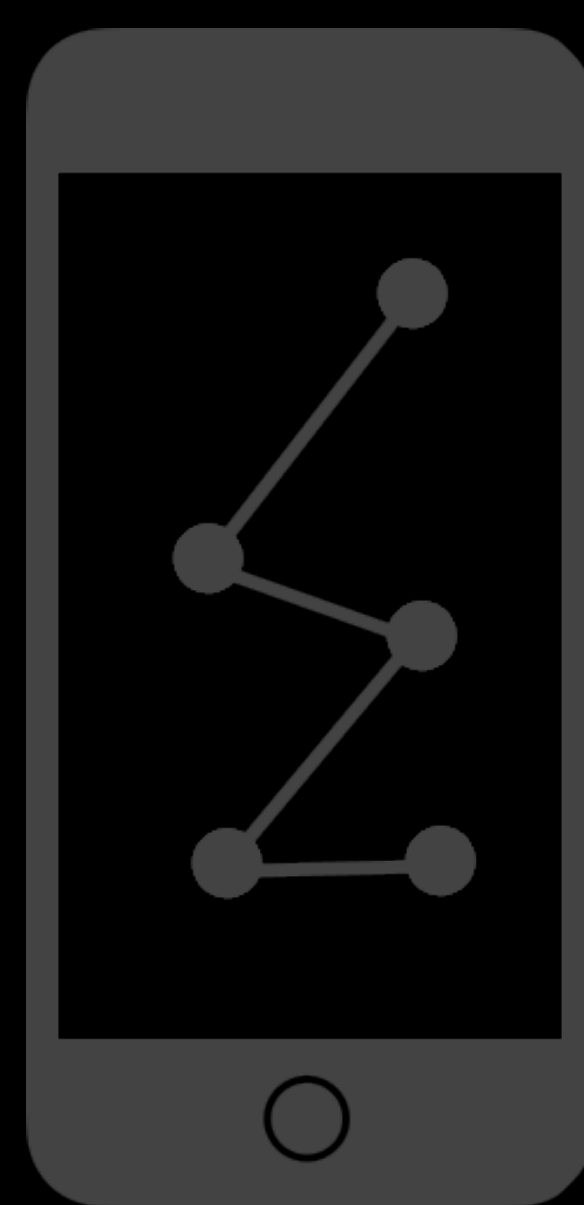
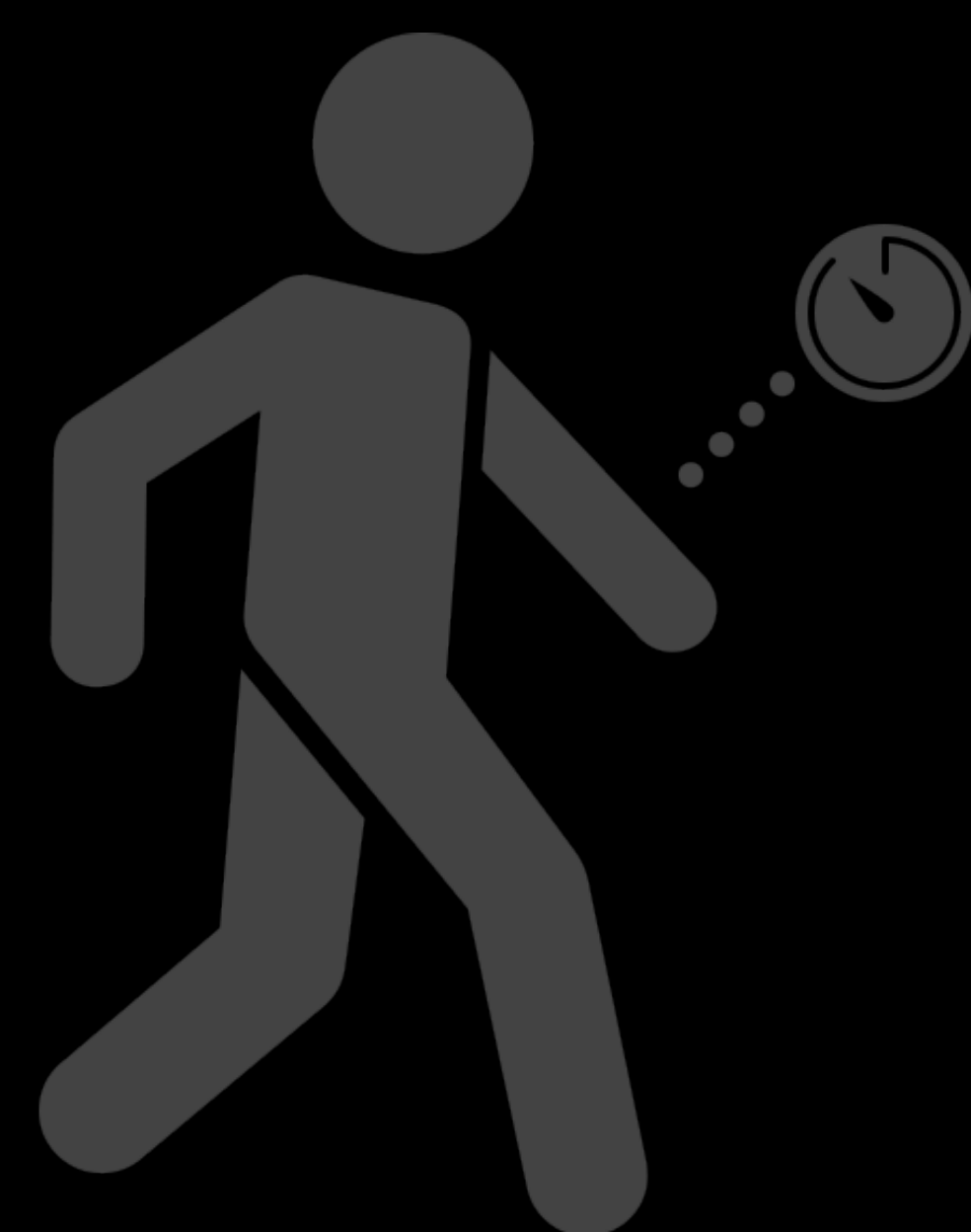
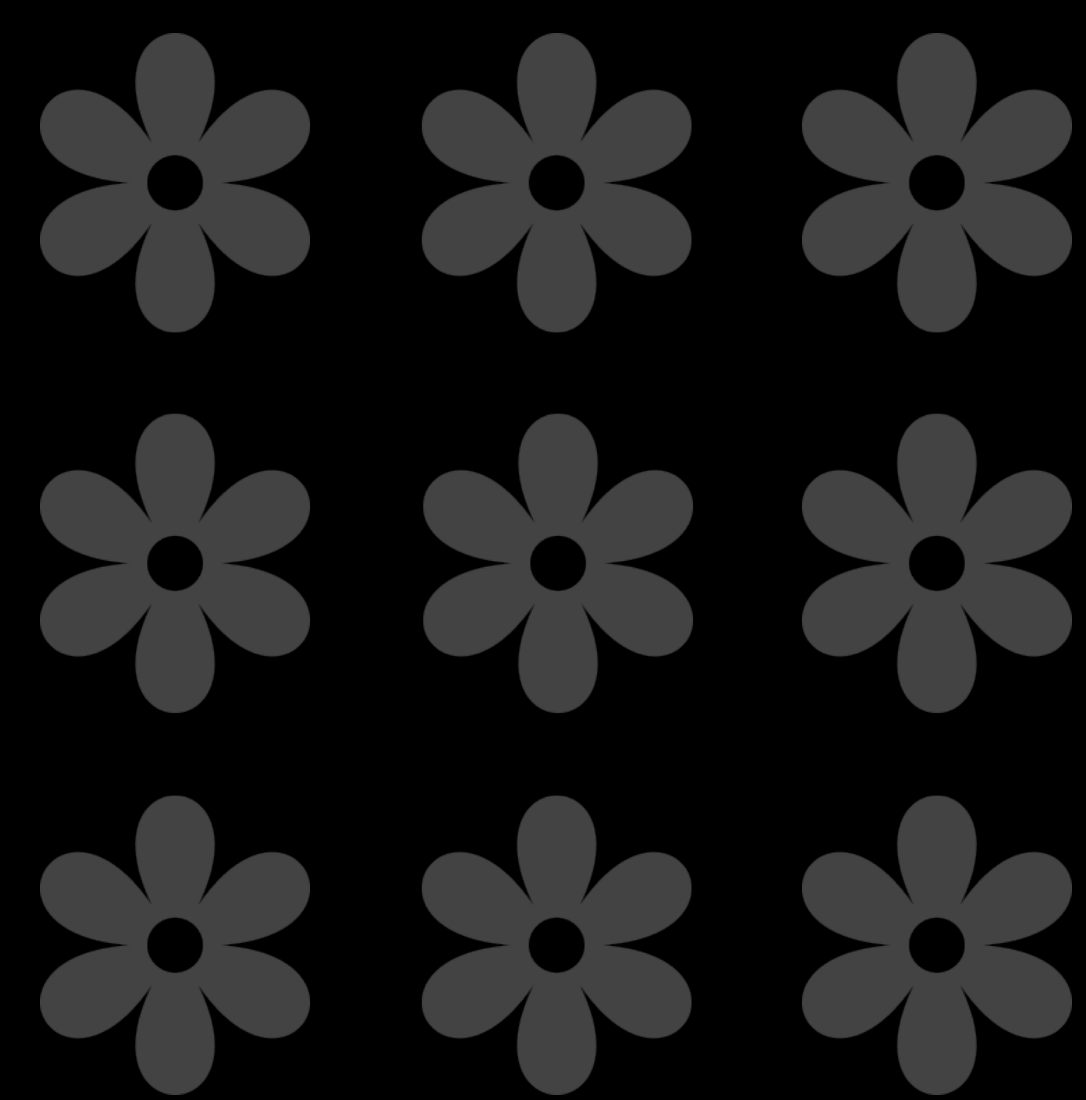
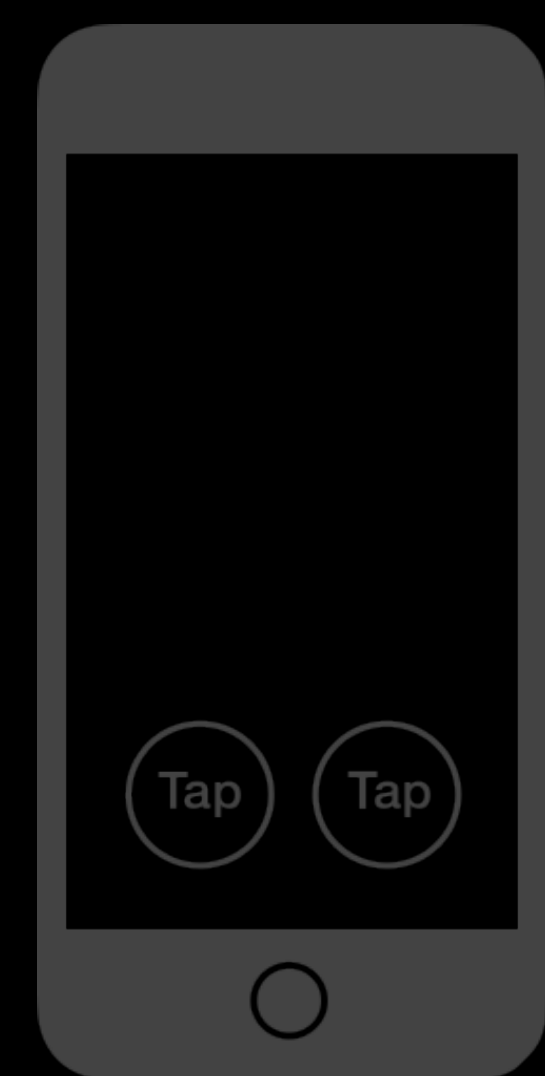
```
var healthFHIRResourceType: HKFHIRResourceType?
```

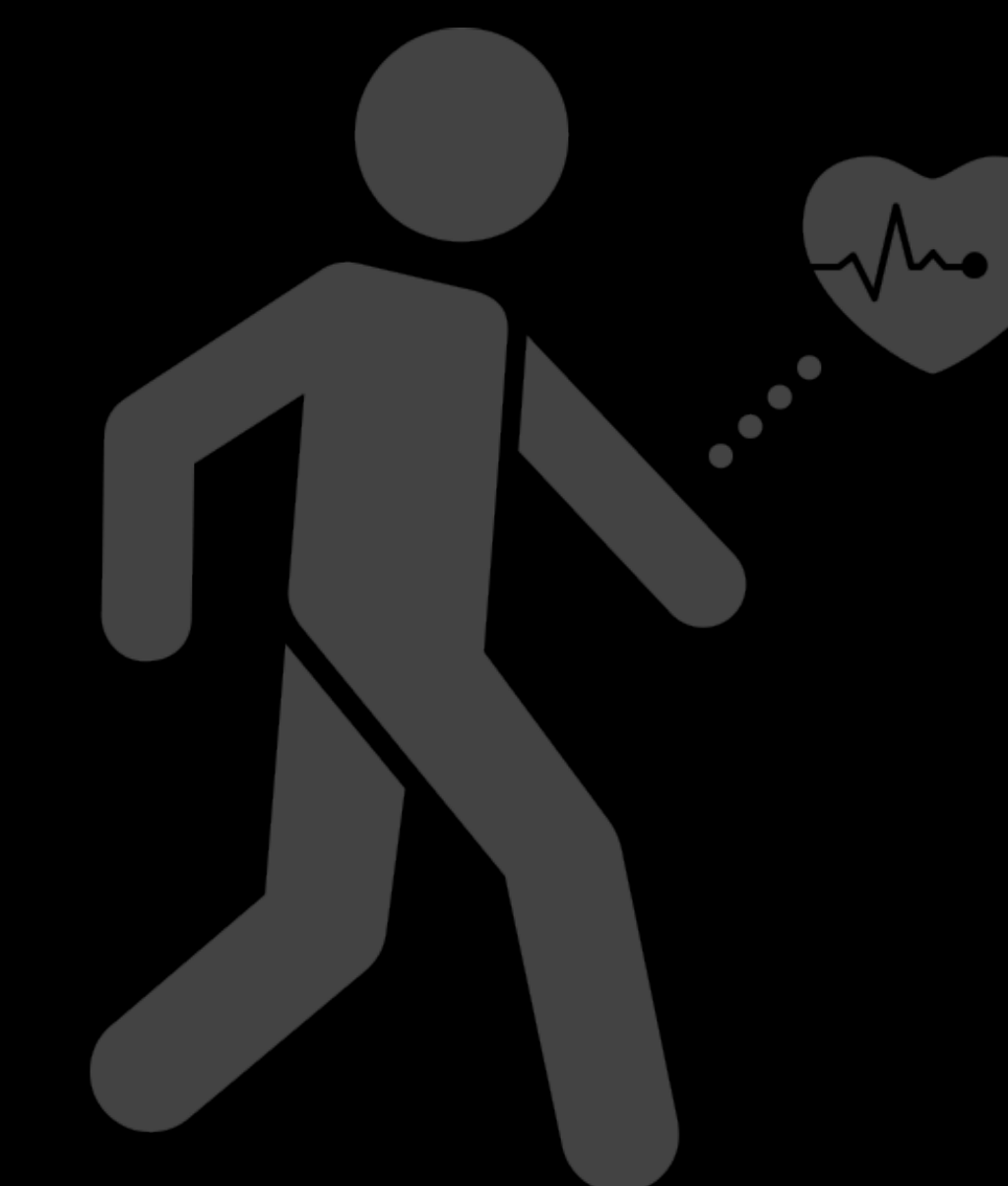
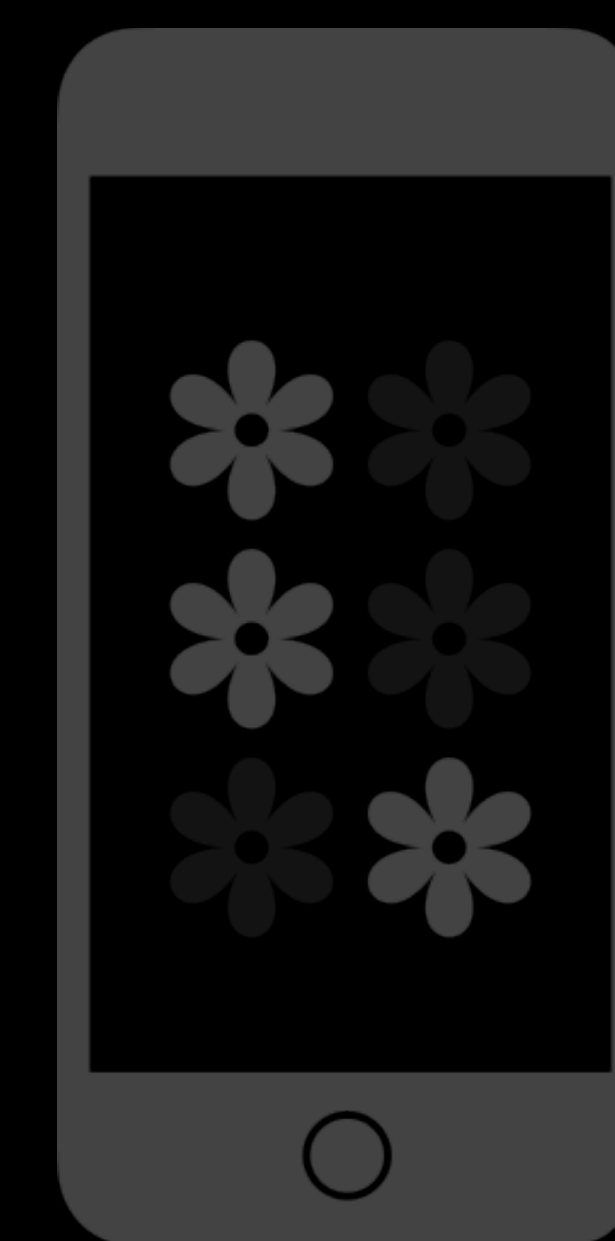
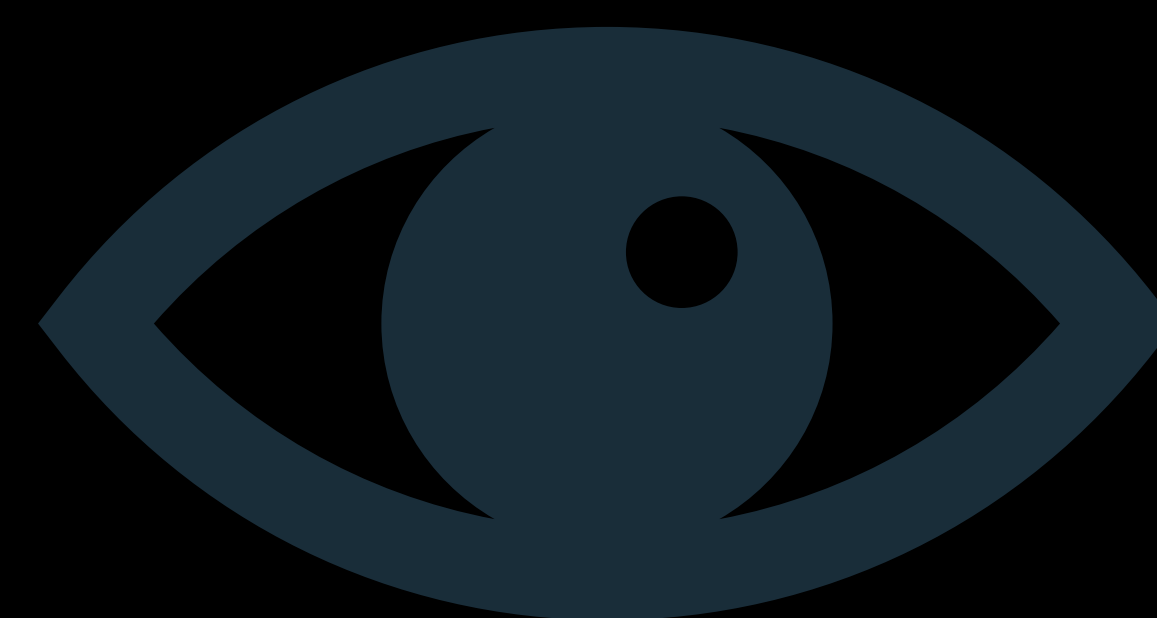
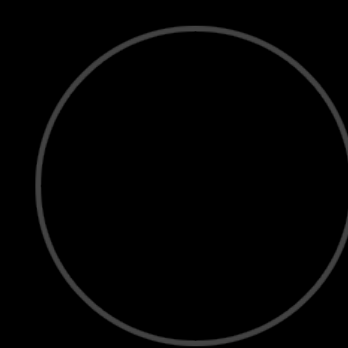
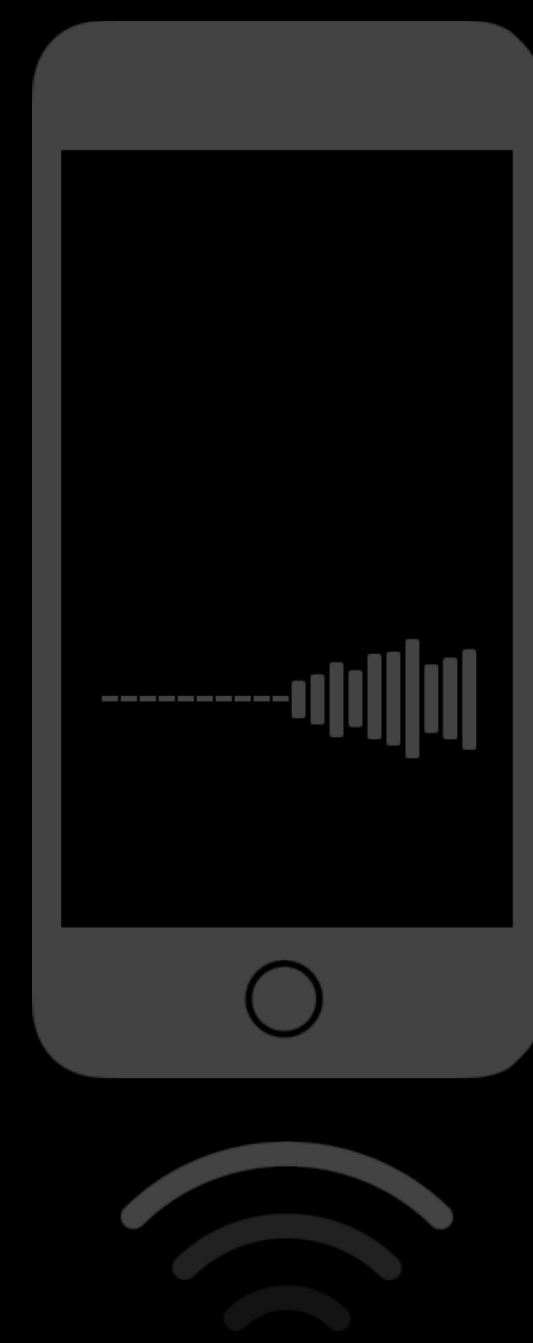
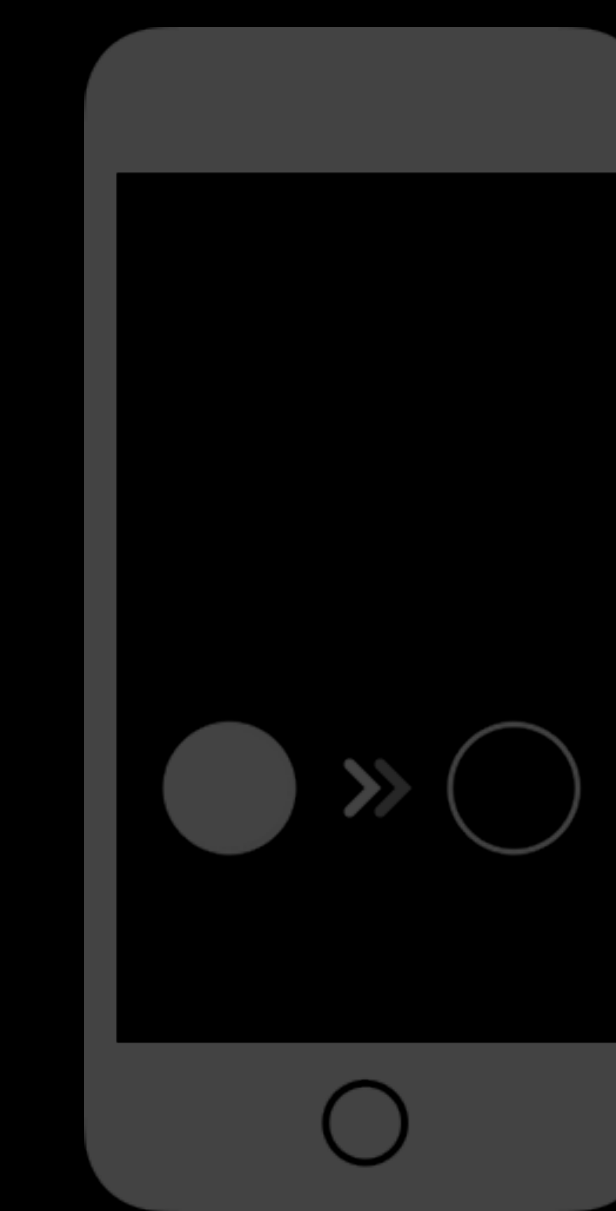
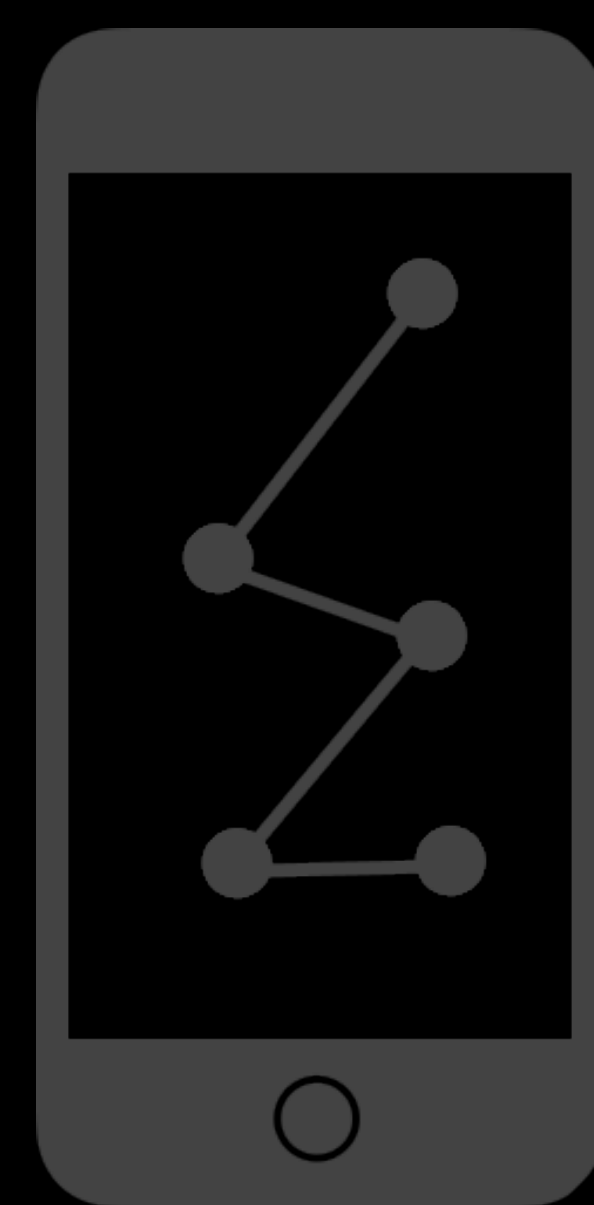
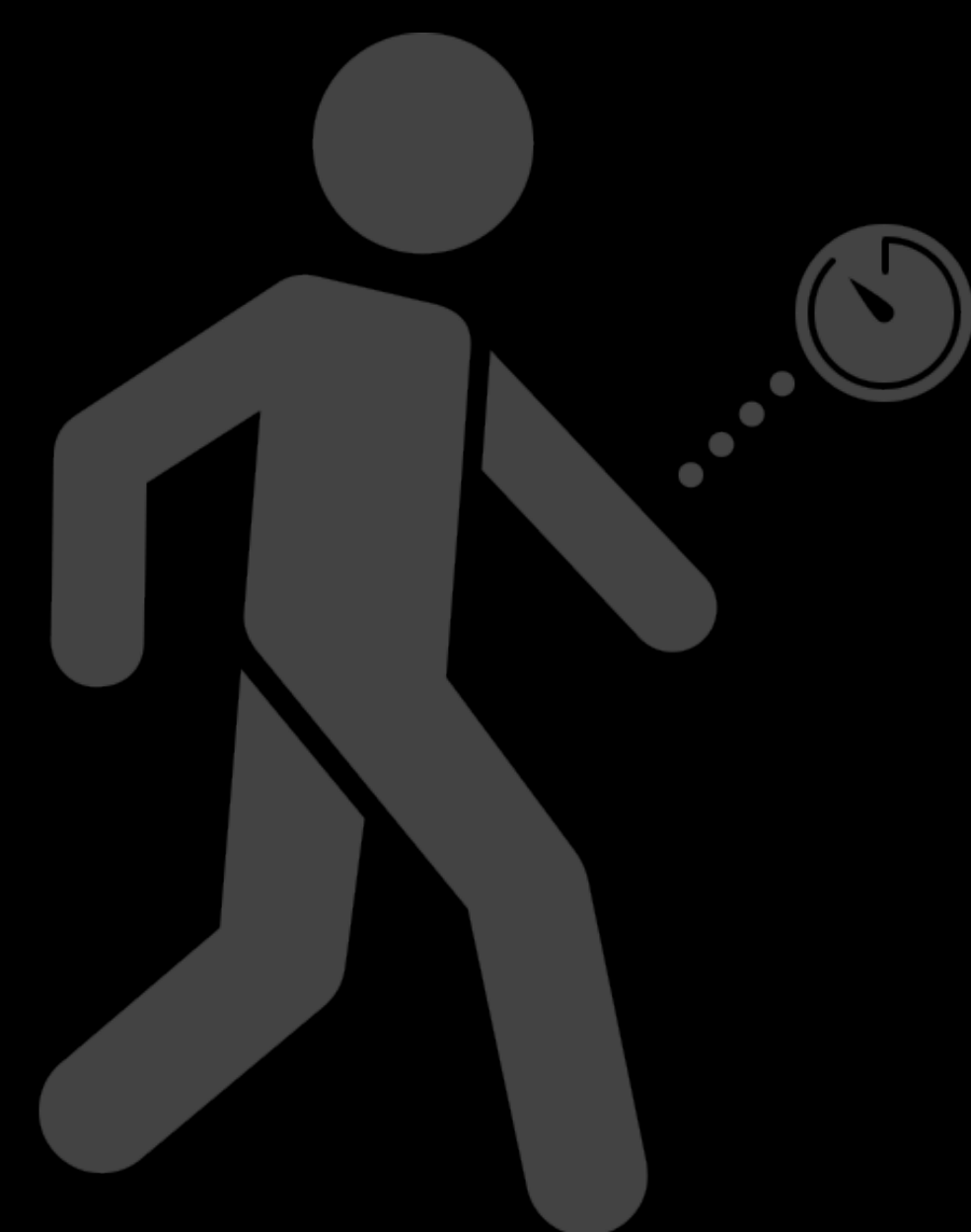
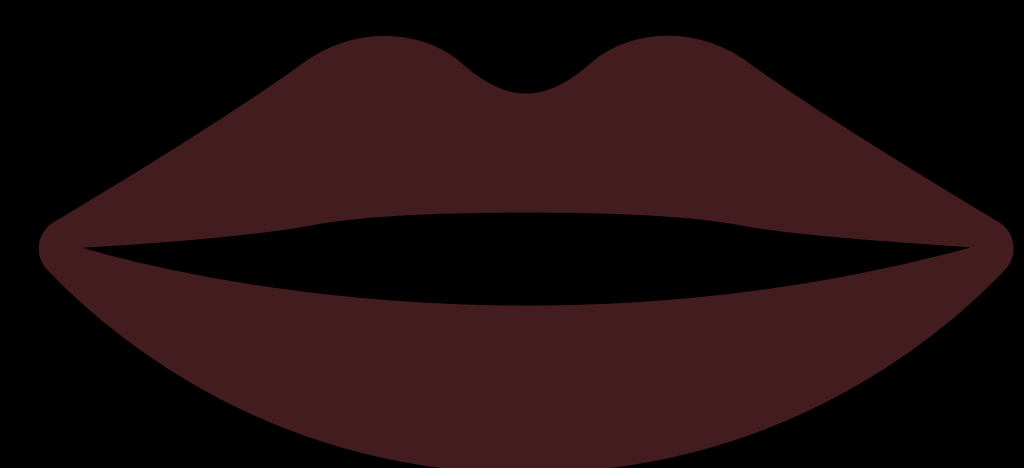
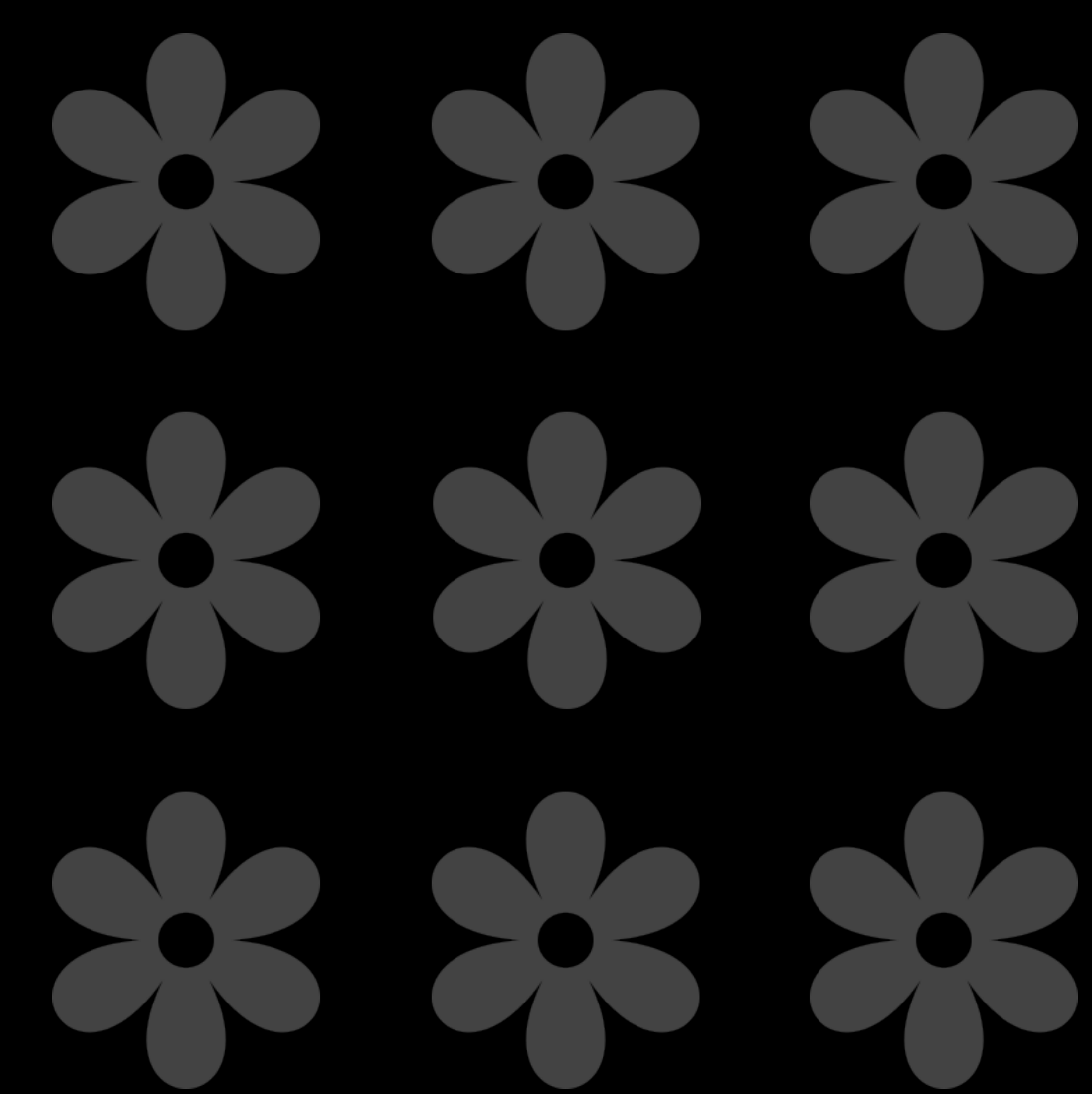
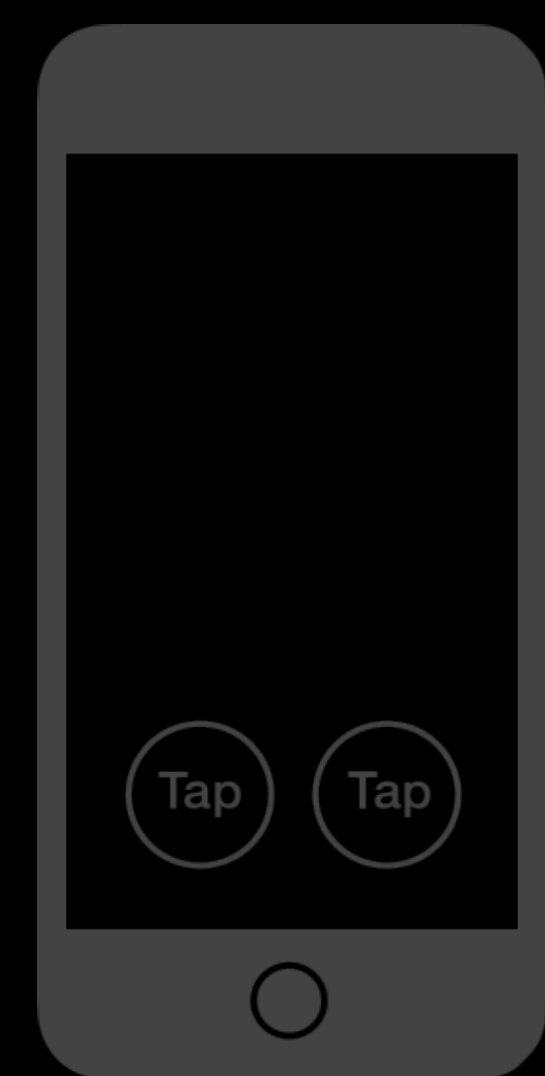
```
let step = ORKShoulderRangeOfMotionStep(identifier: "rangeOfMotionStep", limbOptions: .left)
```

```
let config = ORKHealthClinicalTypeRecorderConfiguration(identifier: "medicationRecorder",  
                                                       healthClinicalType: healthClinicalType,  
                                                       healthFHIRResourceType: healthFHIRResourceType)
```

```
step.recorderConfigurations = [config]
```

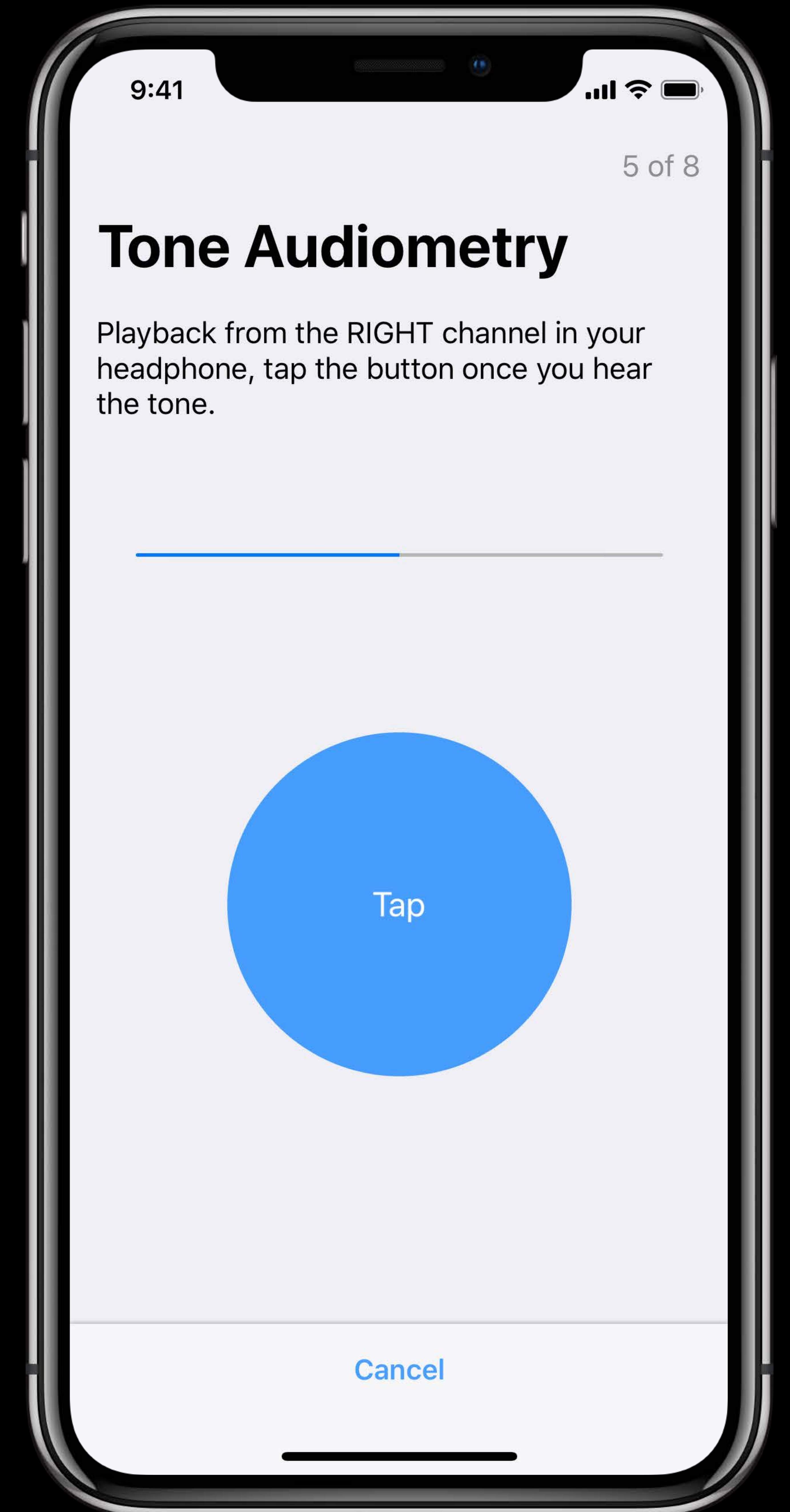




dBHL Tone Audiometry

Implements Hughson-Westlake method

- Determine hearing threshold in dB HL scale



dBHL Tone Audiometry

Implements Hughson-Westlake method

- Determine hearing threshold in dB HL scale

Open sourcing calibration data for AirPods

- Volume curve
- Sensitivity (dB SPL) per frequency
- RETSPL BETA



dBHL Tone Audiometry

Implements Hughson-Westlake method

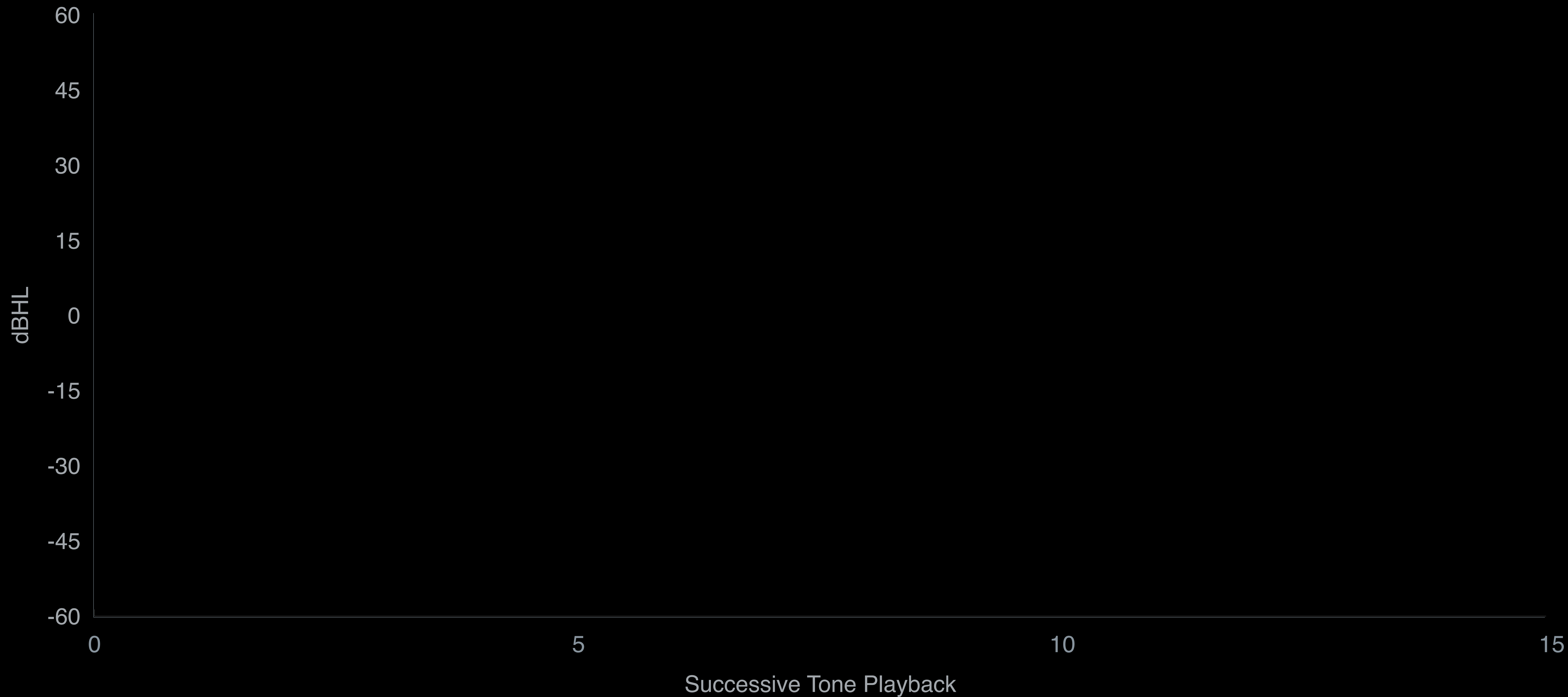
- Determine hearing threshold in dB HL scale

Open sourcing calibration data for AirPods

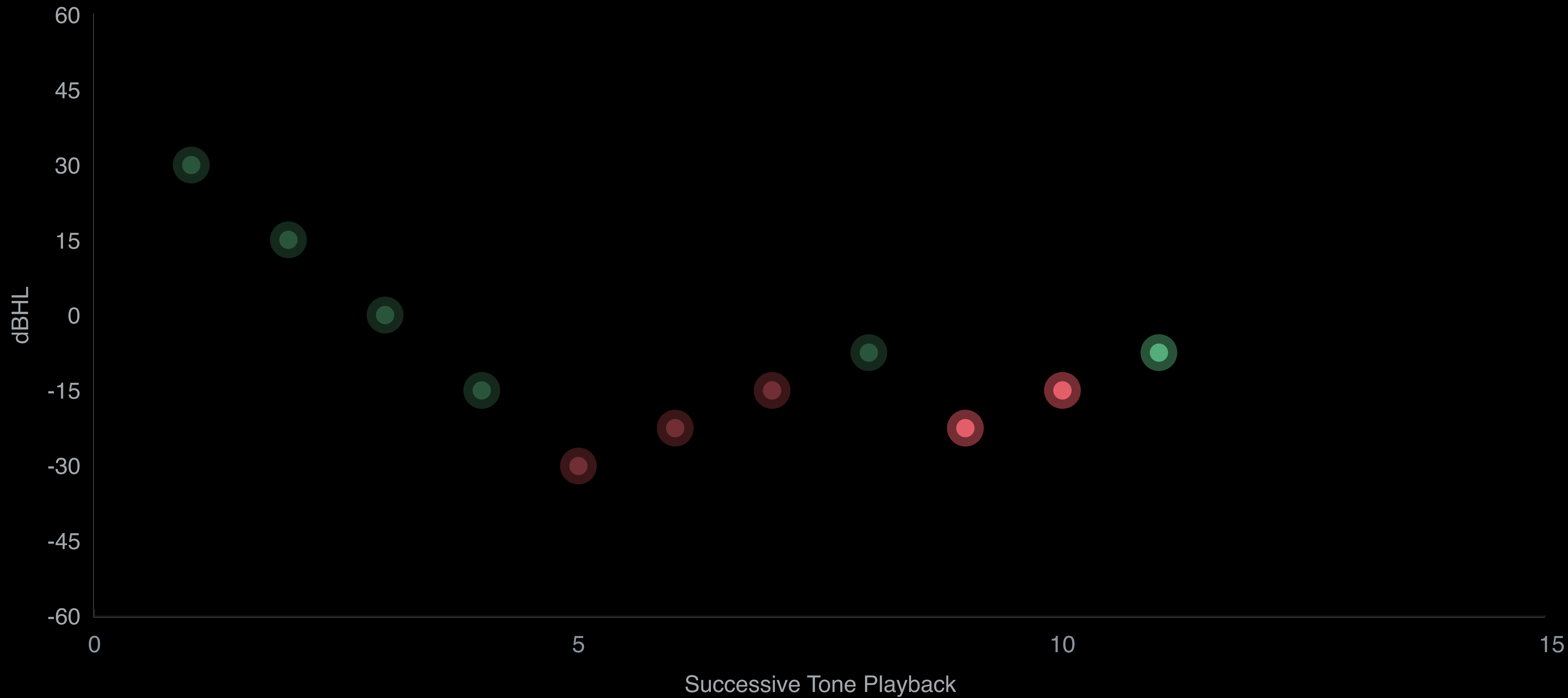
- Volume curve
- Sensitivity (dB SPL) per frequency
- RETSPL BETA



Hughson-Westlake Method



Hughson-Westlake Method

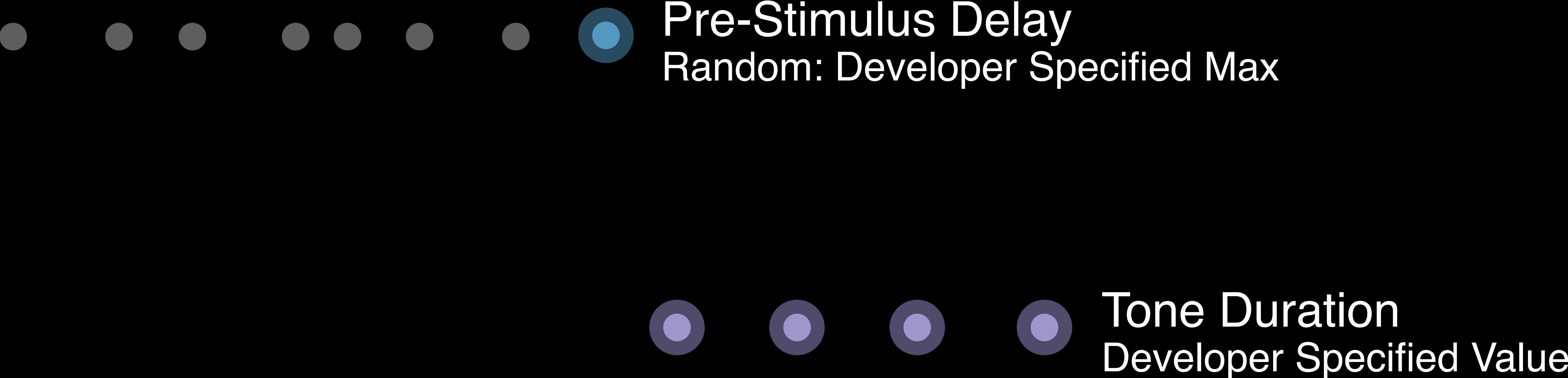


Tone Generation Parameters

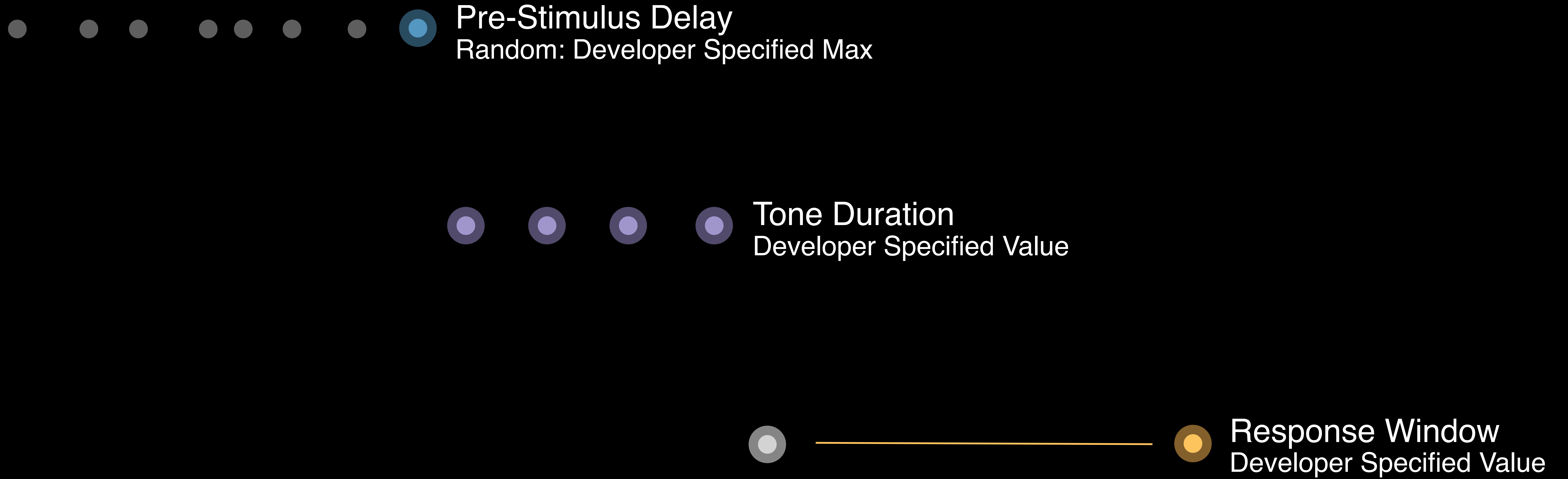
Tone Generation Parameters

-
-
-
-
-
-
-
- **Pre-Stimulus Delay**
Random: Developer Specified Max

Tone Generation Parameters



Tone Generation Parameters



```
//dBHL Tone Audiometry Step
```

```
import ResearchKit
```

```
let step = ORKdBHLToneAudiometryStep(identifier: "dBHLToneAudiometryStep")
```

```
step.frequencyList = [1000.0, 2000.0]
```

```
step.maxRandomPreStimulusDelay = 2.0
```

```
step.toneDuration = 3.0
```

```
step.postStimulusDelay = 1.0
```

```
//dBHL Tone Audiometry Step
```

```
import ResearchKit
```

```
let step = ORKdBHLToneAudiometryStep(identifier: "dBHLToneAudiometryStep")
```

```
step.frequencyList = [1000.0, 2000.0]
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step.maxRandomPreStimulusDelay = 2.0
```

```
step.toneDuration = 3.0
```

```
step.postStimulusDelay = 1.0
```

```
//dBHL Tone Audiometry Step
```

```
import ResearchKit
```

```
let step = ORKdBHLToneAudiometryStep(identifier: "dBHLToneAudiometryStep")
```

```
step.frequencyList = [1000.0, 2000.0]
```

```
step.maxRandomPreStimulusDelay = 2.0
```

```
step.toneDuration = 3.0
```

```
step.postStimulusDelay = 1.0
```

```
step.initialdBHLValue = 30.0
```

```
step.dBHLStepUpSize = 5.0
```

```
step.dBHLStepDownSize = 10.0
```

```
step.maxNumberOfTransitionsPerFrequency = 15
```



```
Result {  
    headphoneType  
    outputVolume  
    postStimulusDelay  
    toneDuration  
    [ Sample ]  
}
```

Result { ... }

Sample {
channel
frequency
threshold
[Unit]
}

Result { ... }

Sample { ... }

Unit {

dBHLValue

preStimulusDelay

startOfUnitTimestamp

timeoutTimestamp

userTapTimestamp

}

Environment SPL Meter

Measures environment sound pressure level

- Implements an A-weighting filter
- Accepts an upper threshold limit
- Can be used as a gating step



Environment SPL Meter

Measures environment sound pressure level

- Implements an A-weighting filter
- Accepts an upper threshold limit
- Can be used as a gating step



```
//Environment SPL Meter Step
```

```
import ResearchKit
```

```
let step = ORKEnvironmentSPLMeterStep(identifier: "environmentSPLMeterStep")
```

```
step.thresholdValue = 60.0
```

```
//Environment SPL Meter Step
```

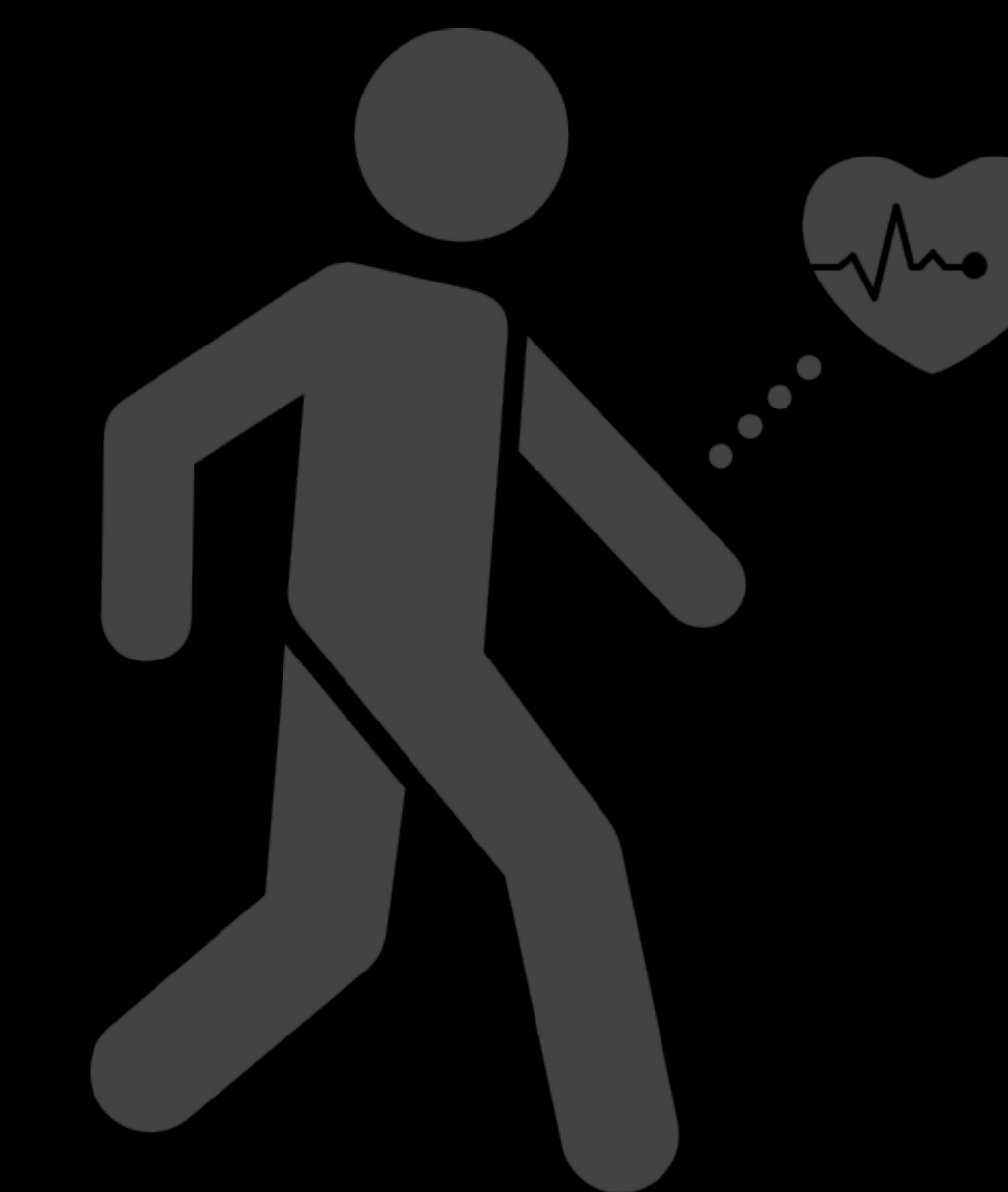
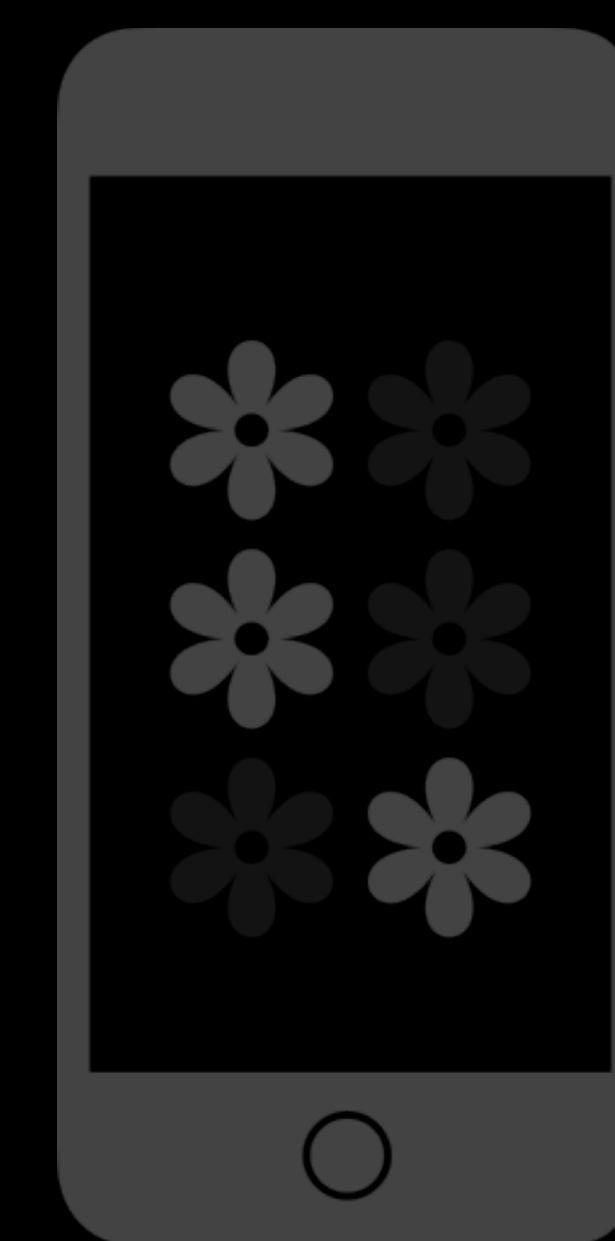
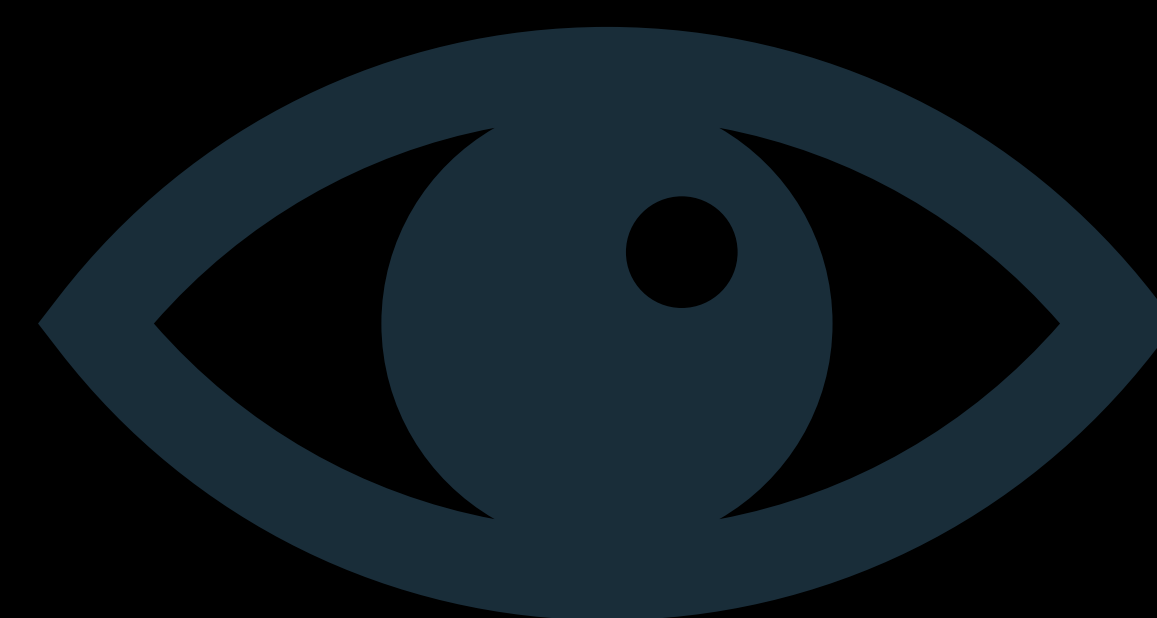
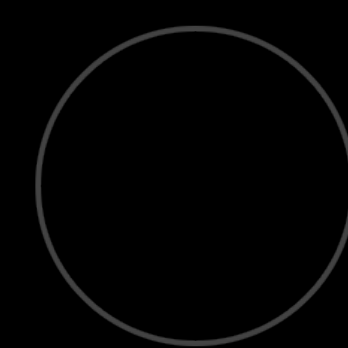
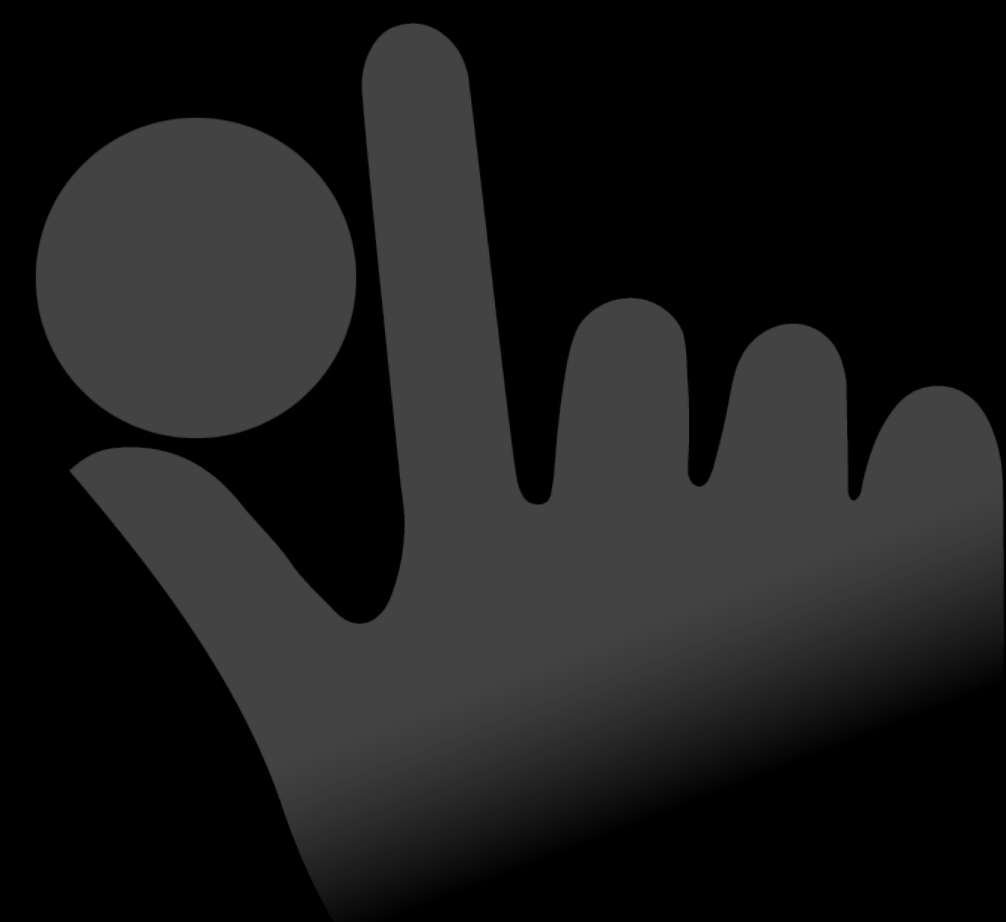
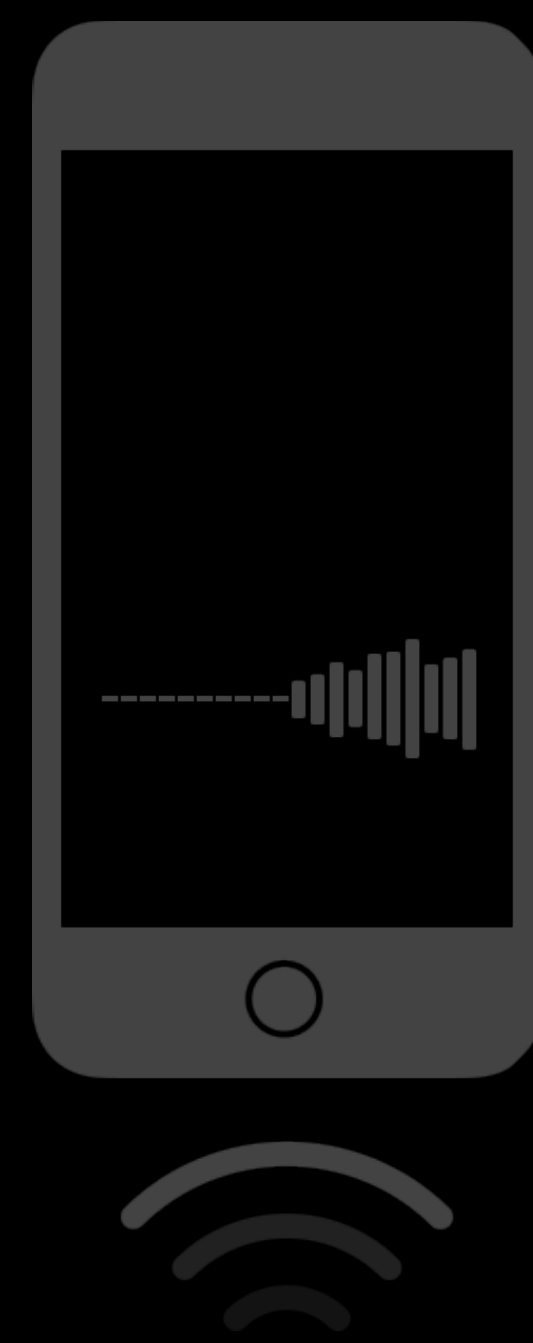
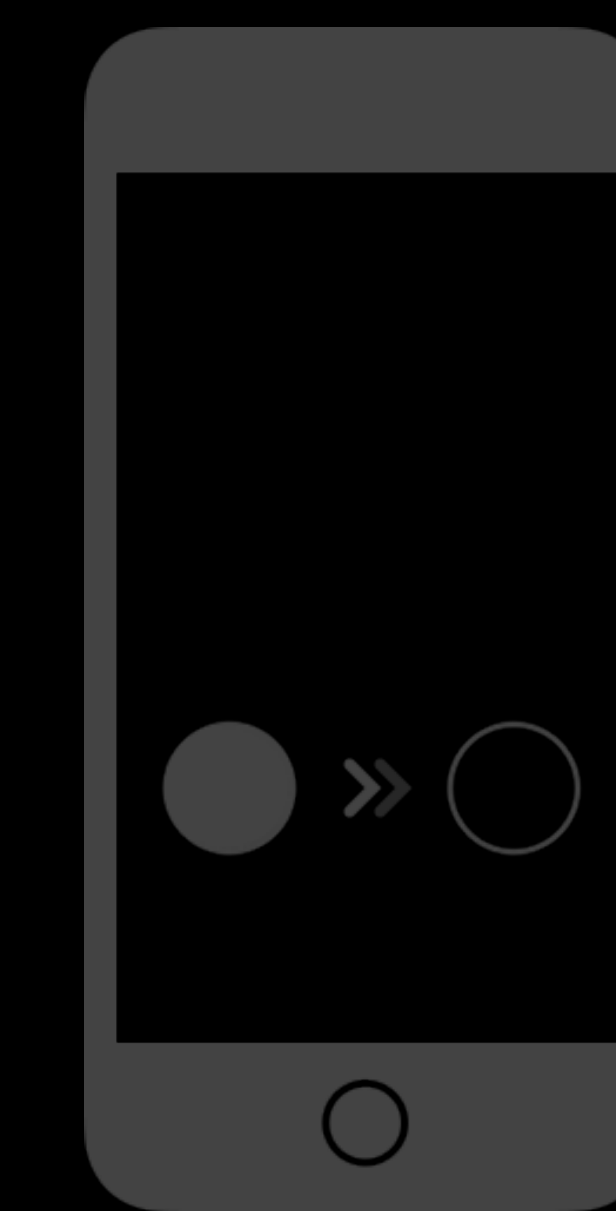
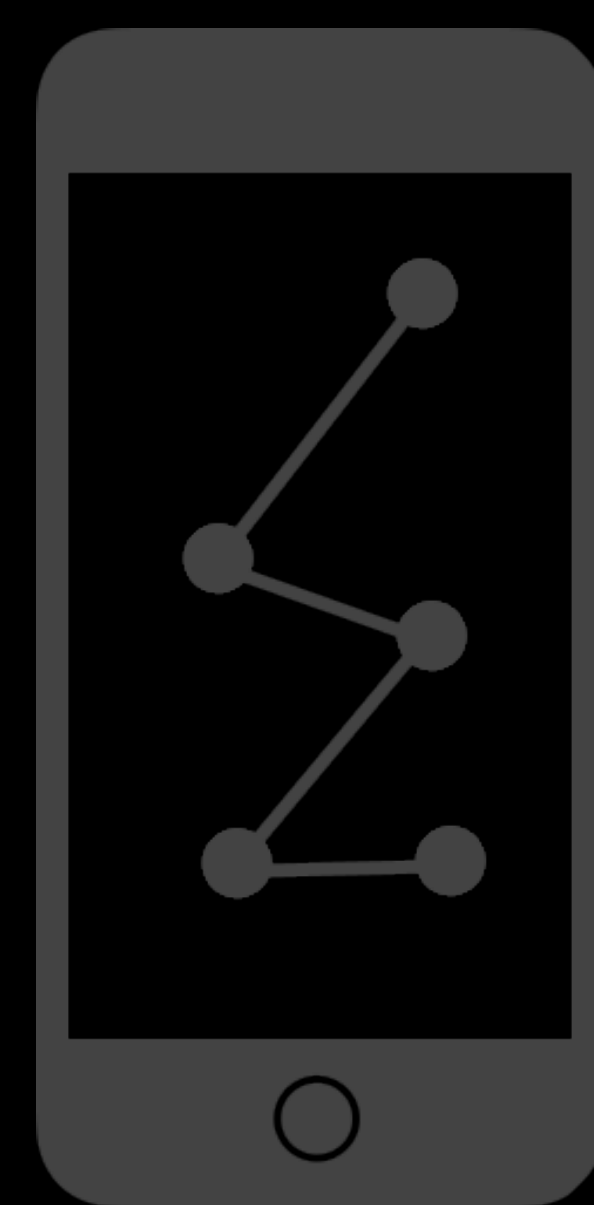
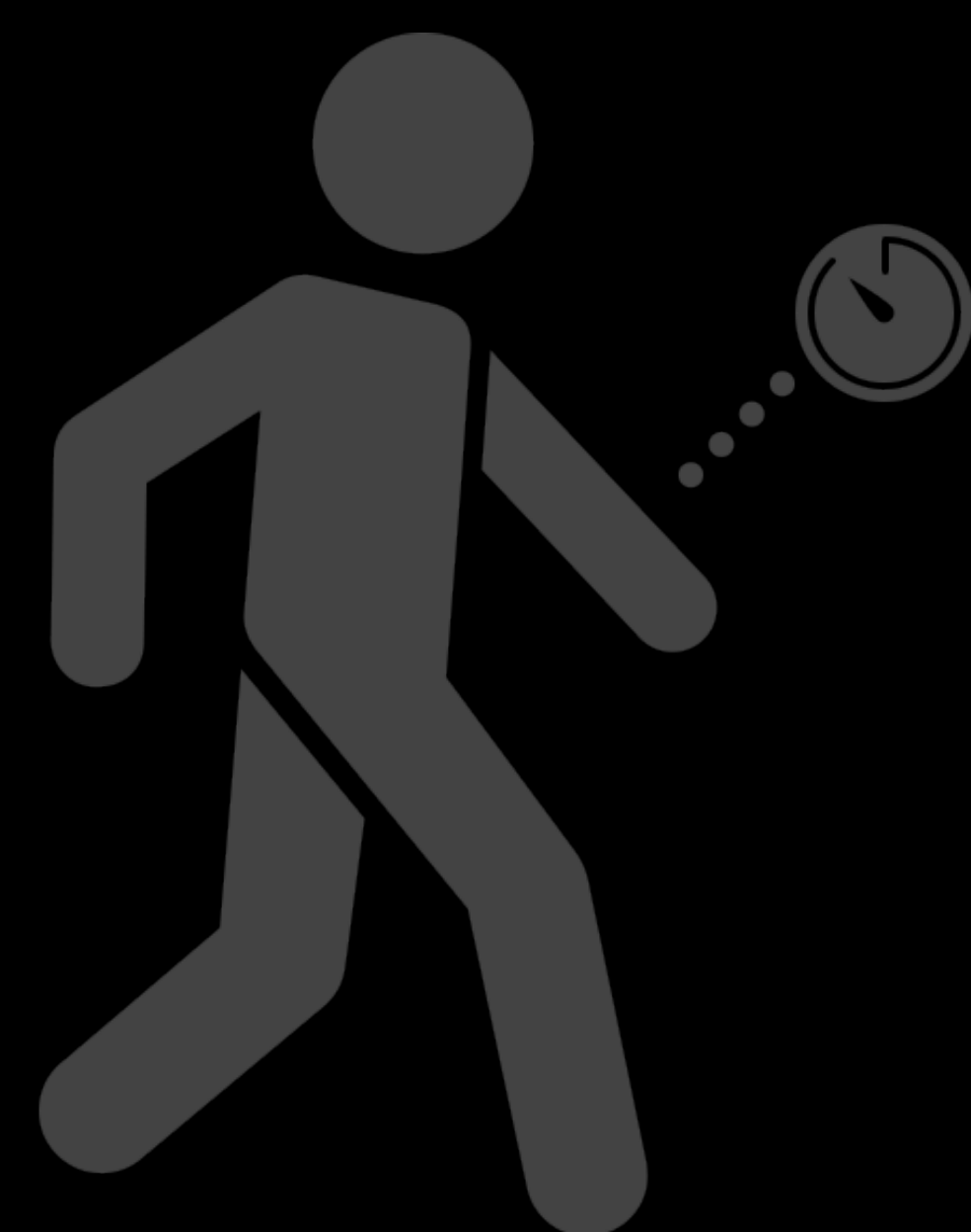
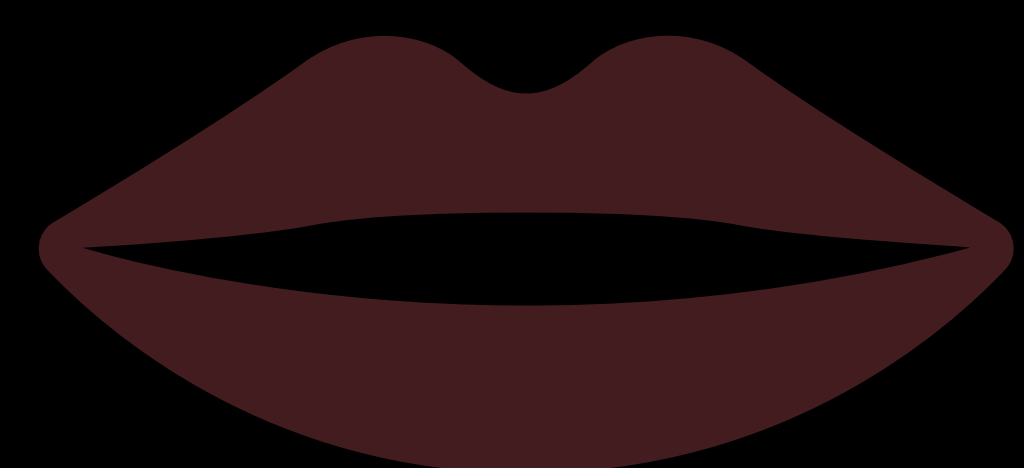
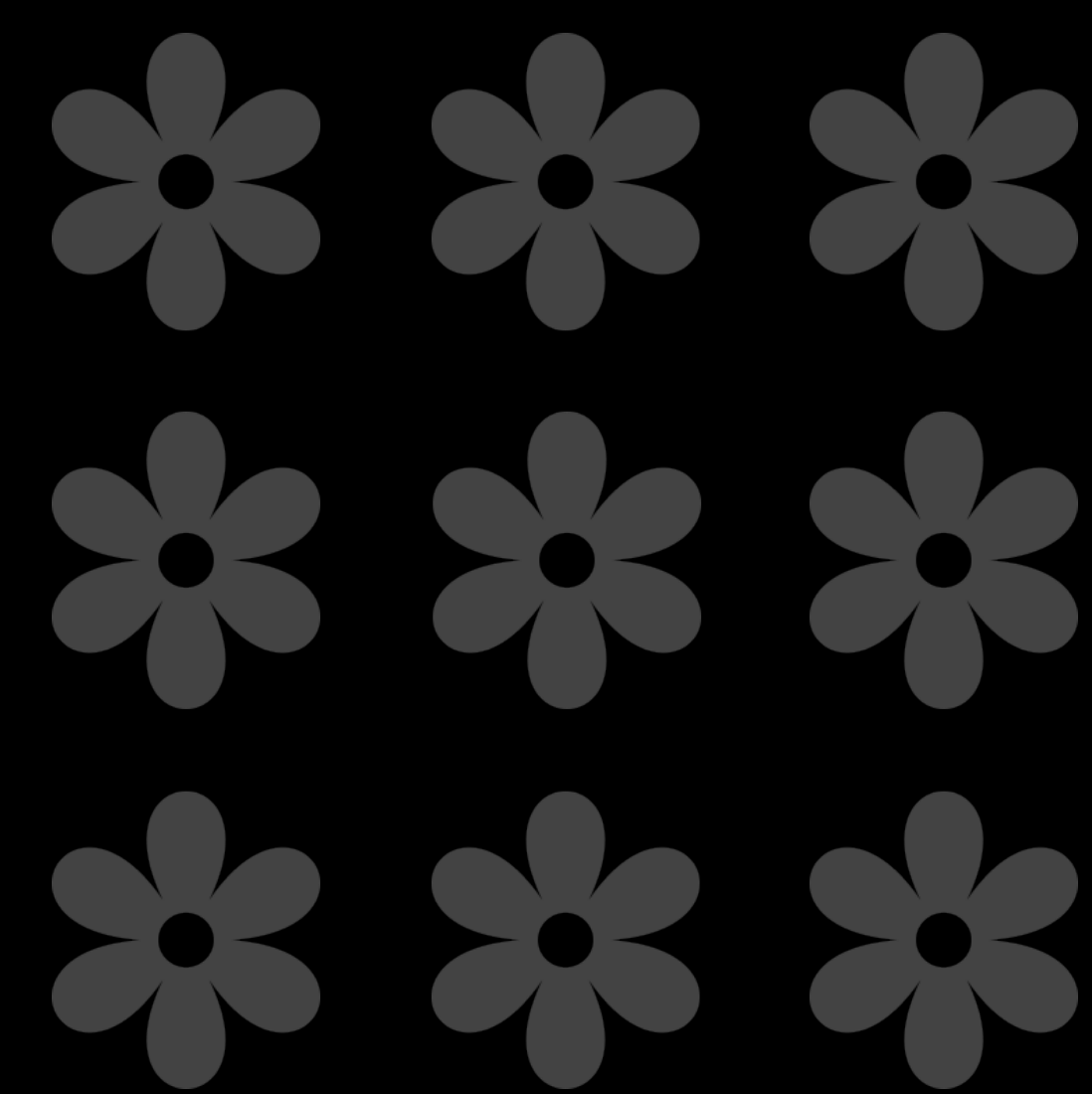
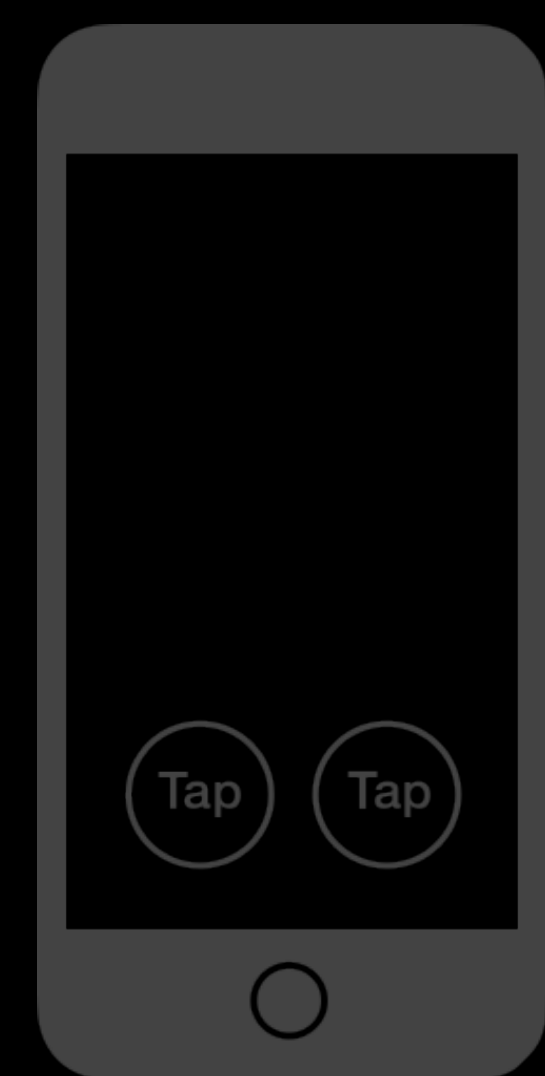
```
import ResearchKit
```

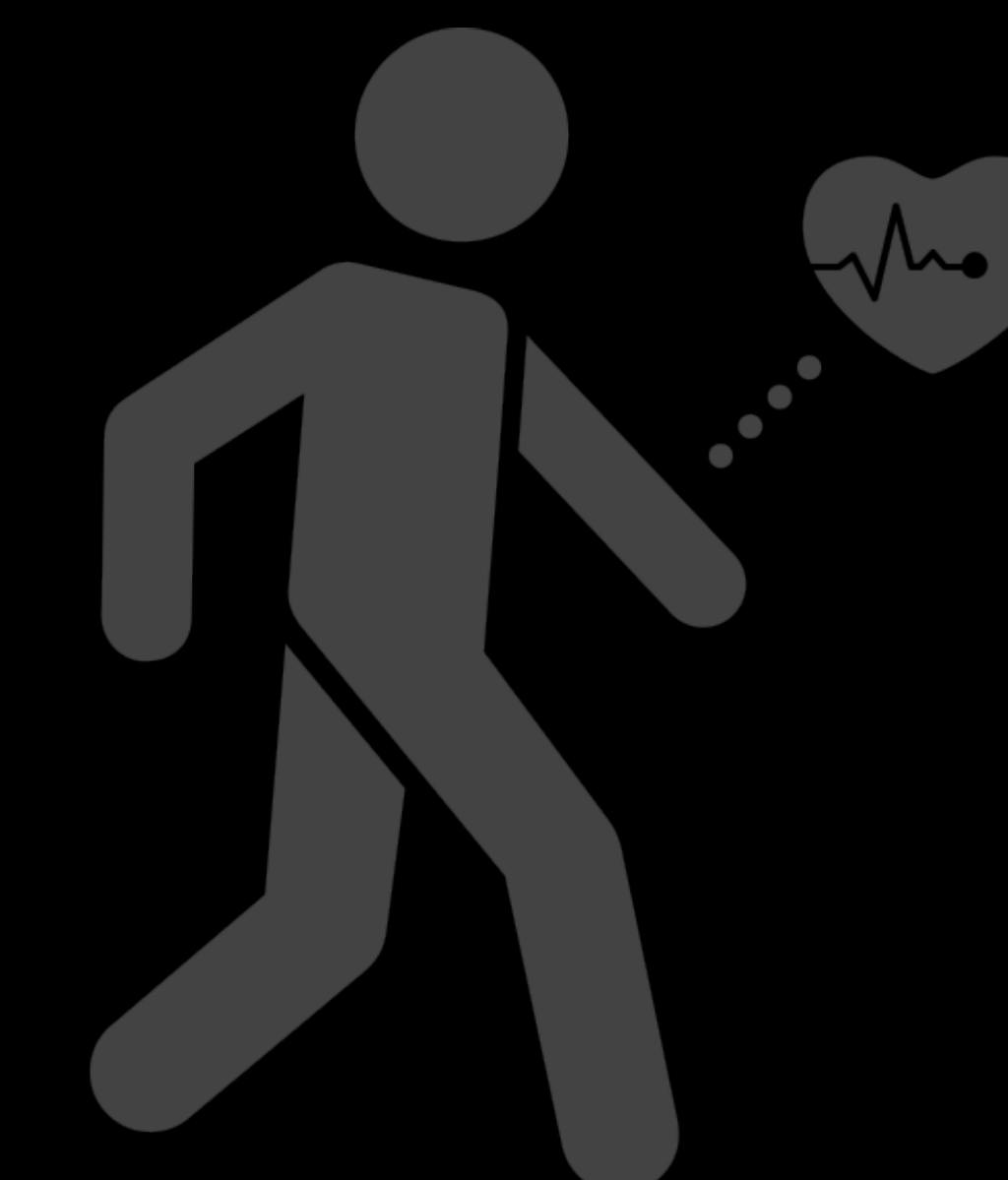
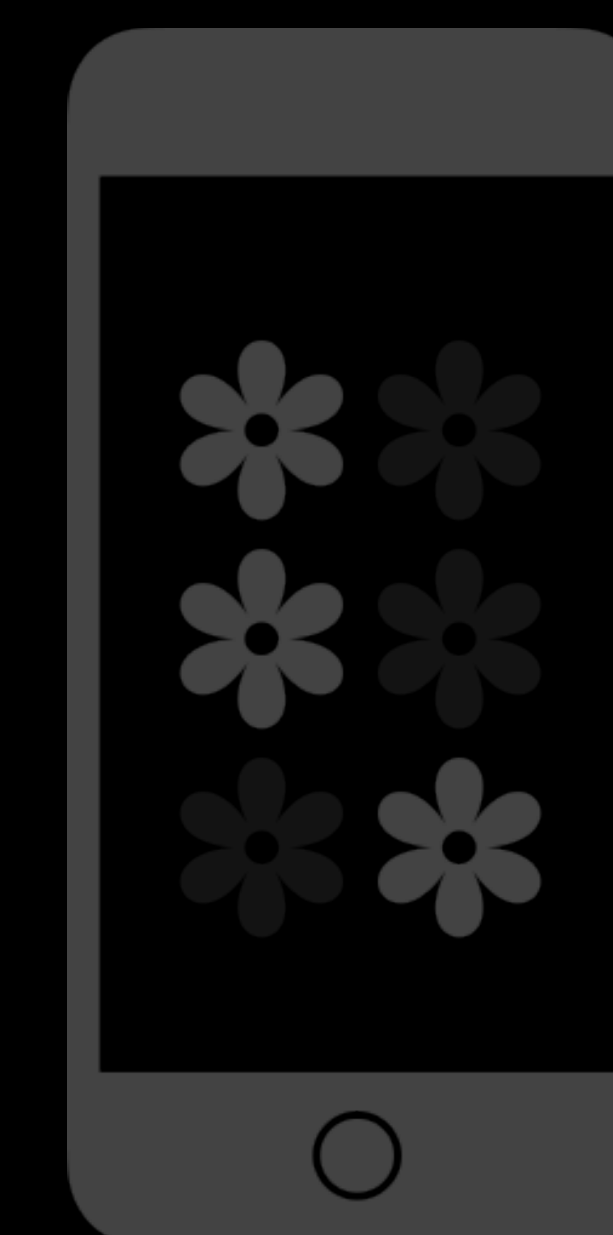
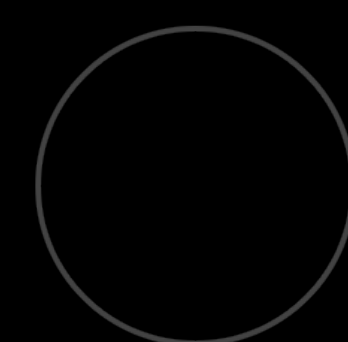
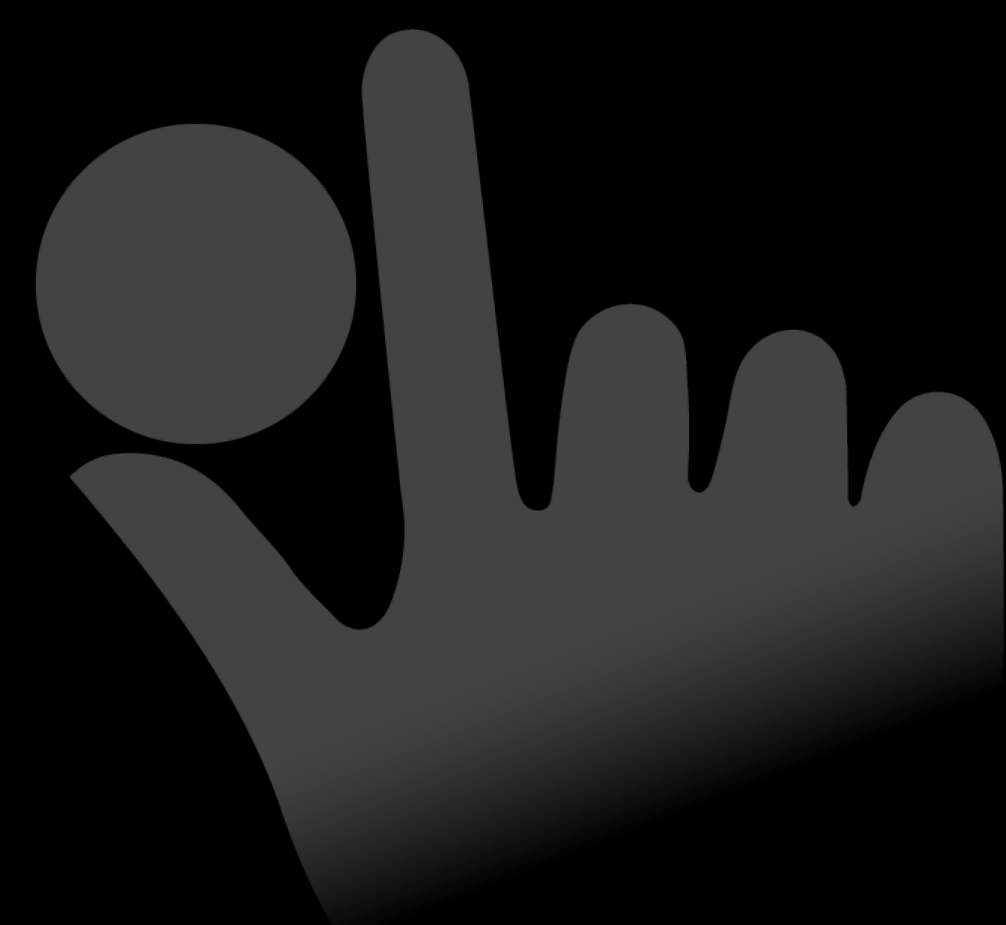
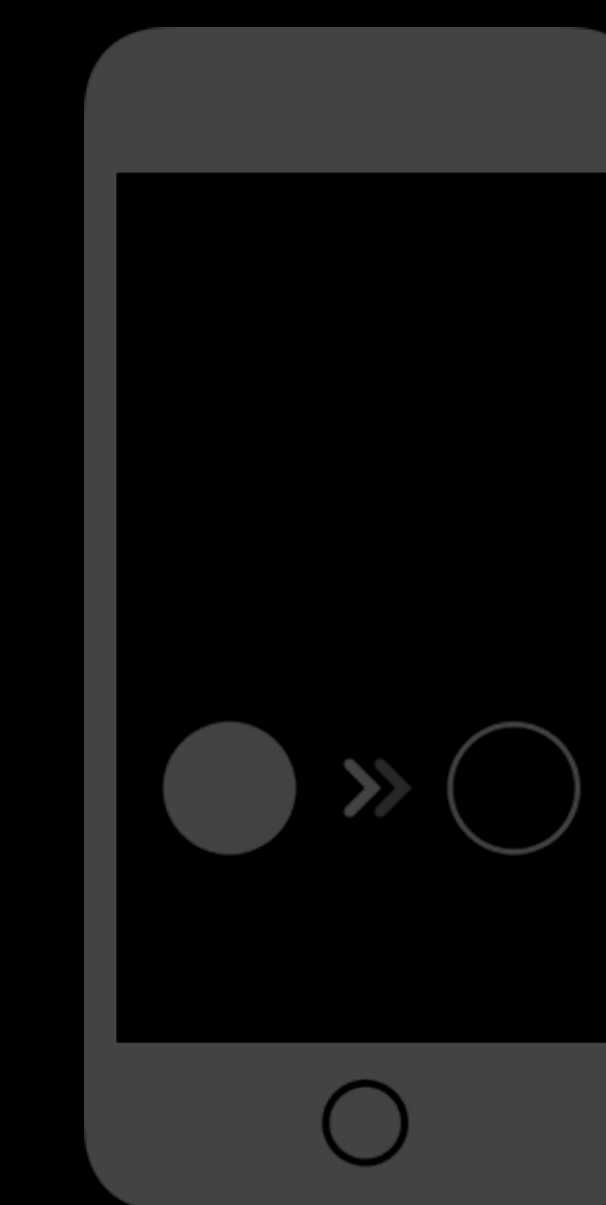
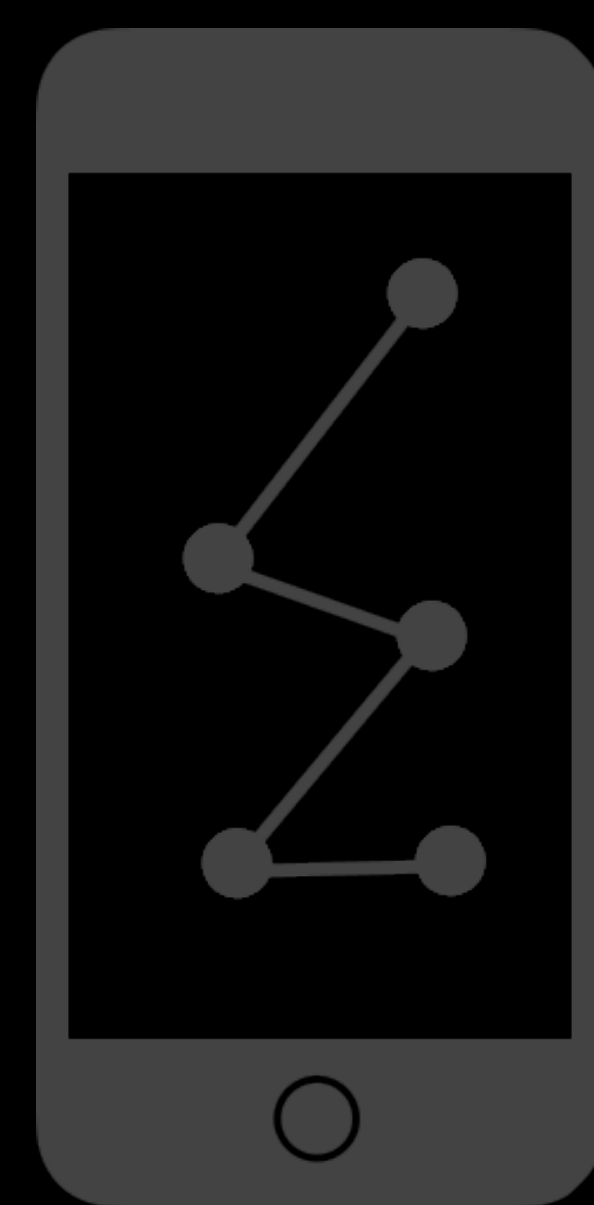
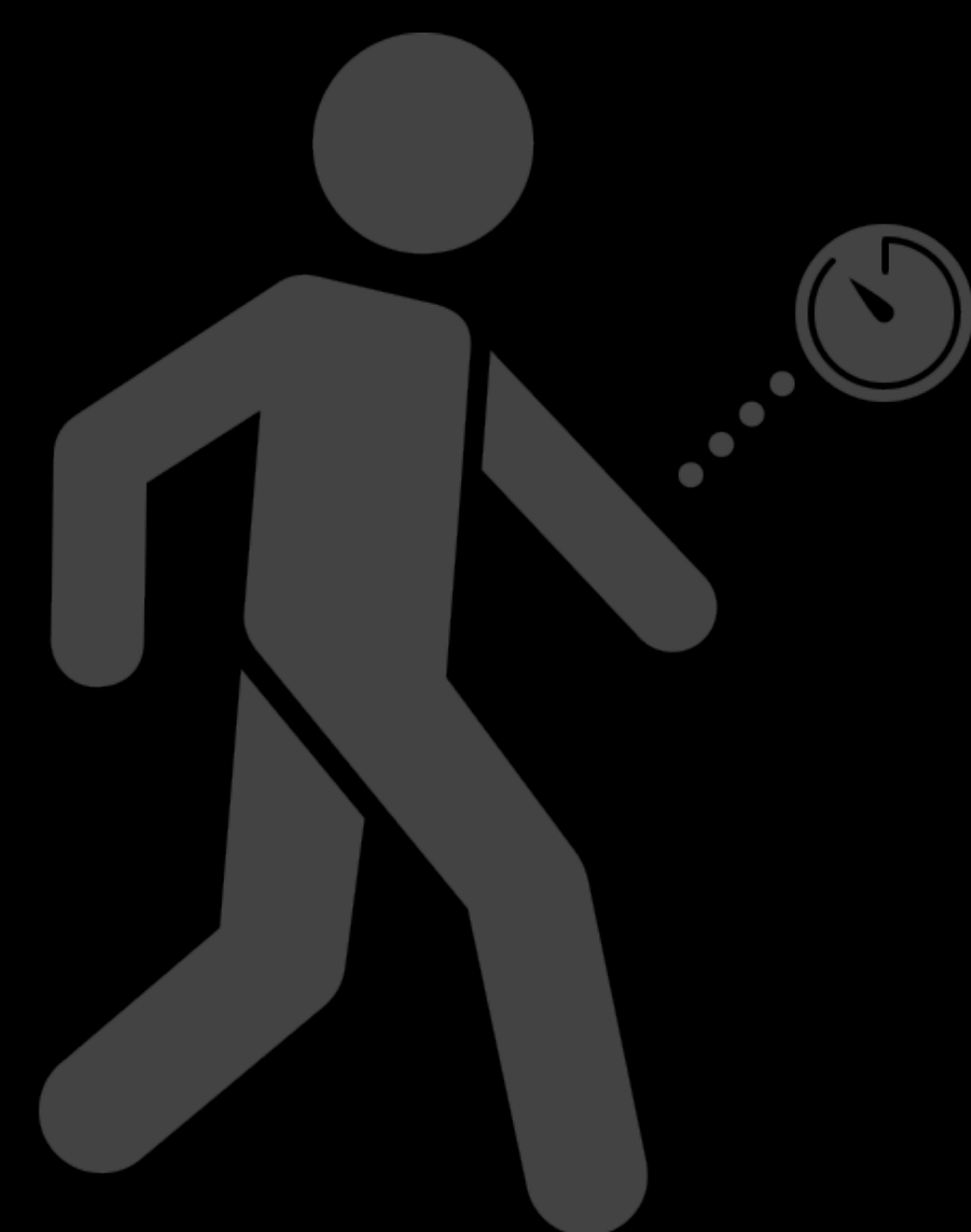
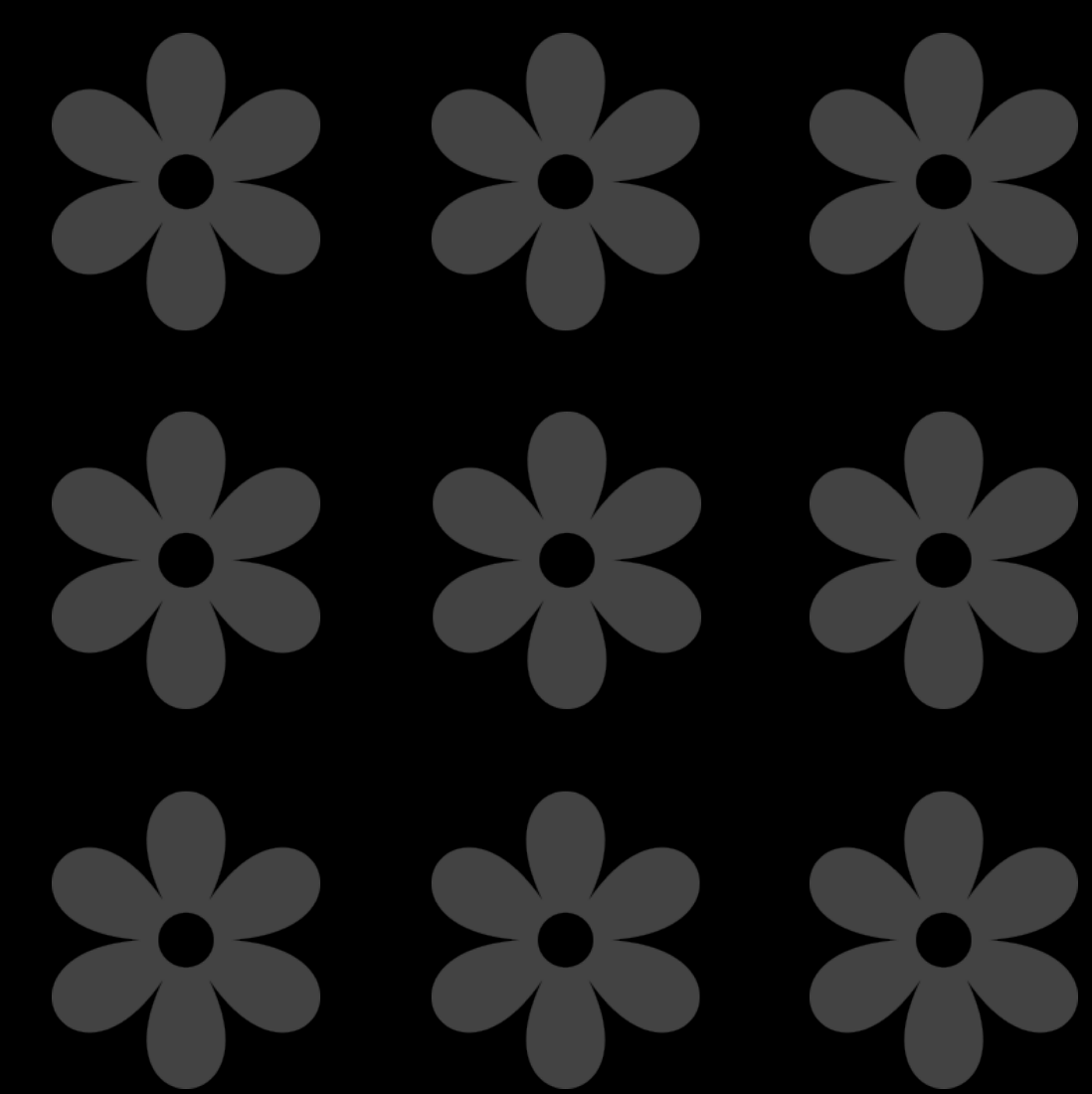
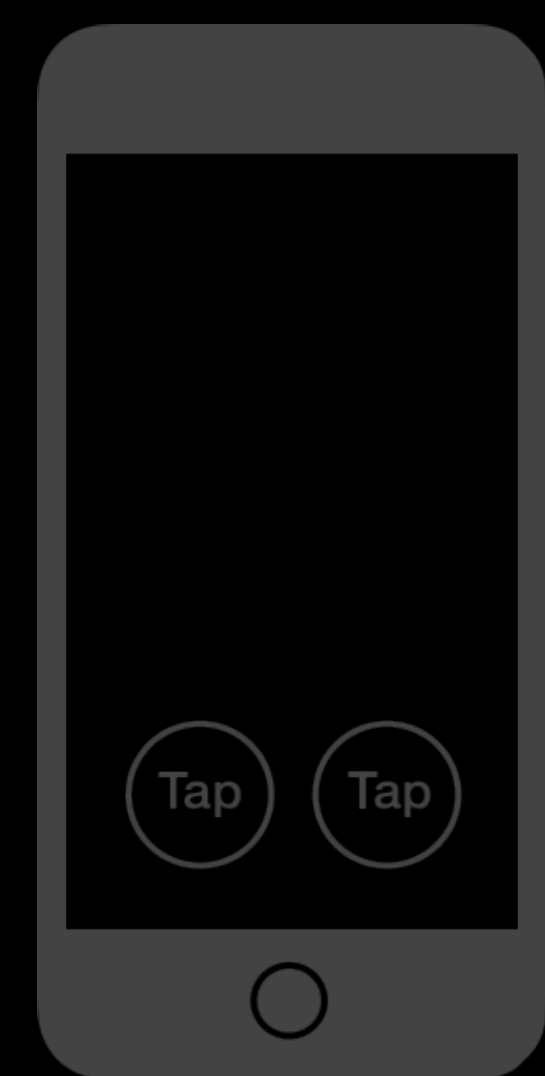
```
let step = ORKEnvironmentSPLMeterStep(identifier: "environmentSPLMeterStep")
```

```
step.thresholdValue = 60.0
```

```
step.samplingInterval = 2.0
```

```
step.requiredContiguousSamples = 5
```

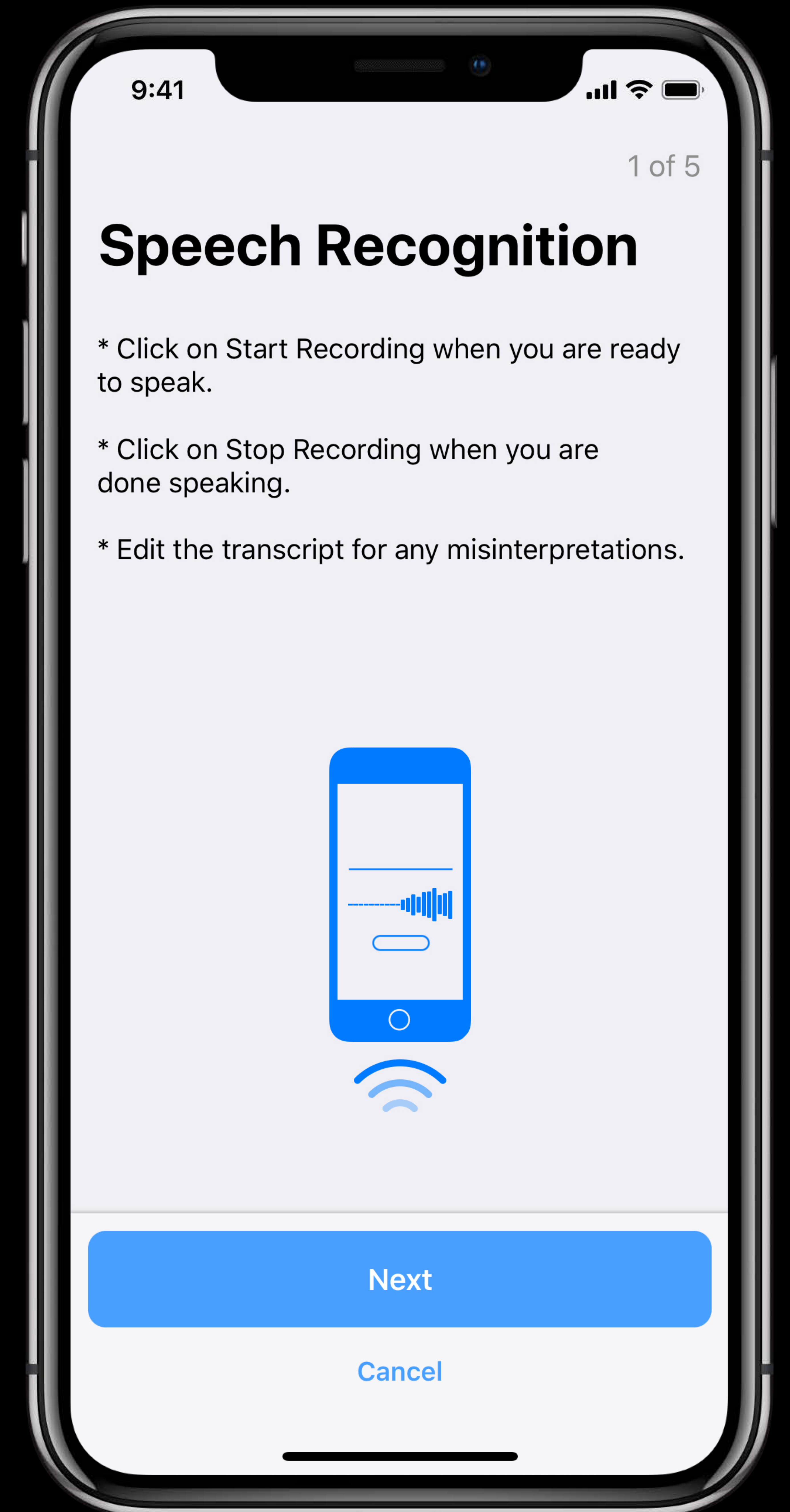




Speech Recognition

Real-time speech recognizer

- Supports over 50 languages and locales
- Users can be asked to repeat a sentence or describe a picture
- Evaluate speech patterns for various medical conditions including cognition and mood



Speech Recognition

A quick brown fox jumps
over the lazy dog



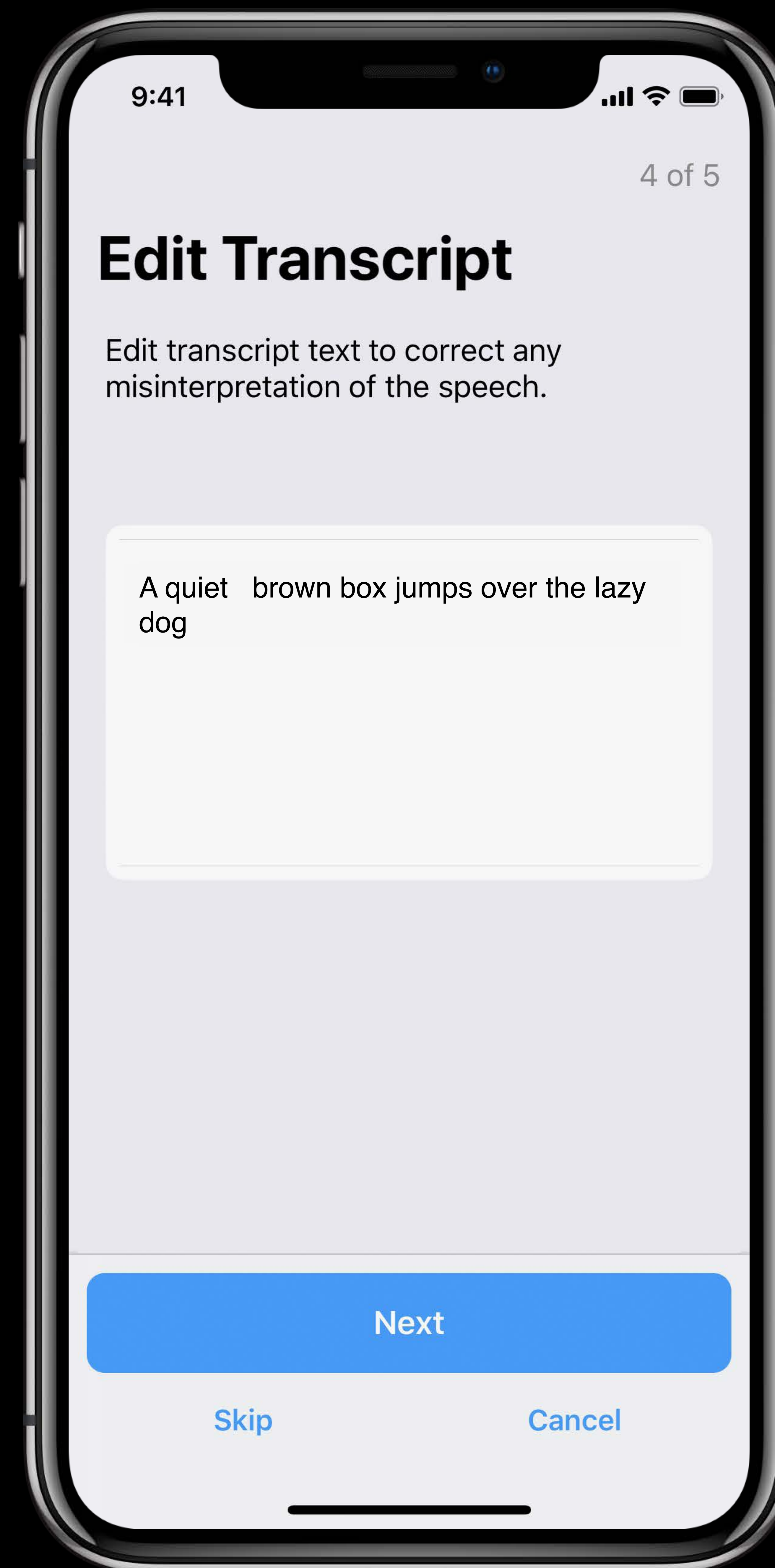
Speech Recognition

A quick brown fox jumps
over the lazy dog



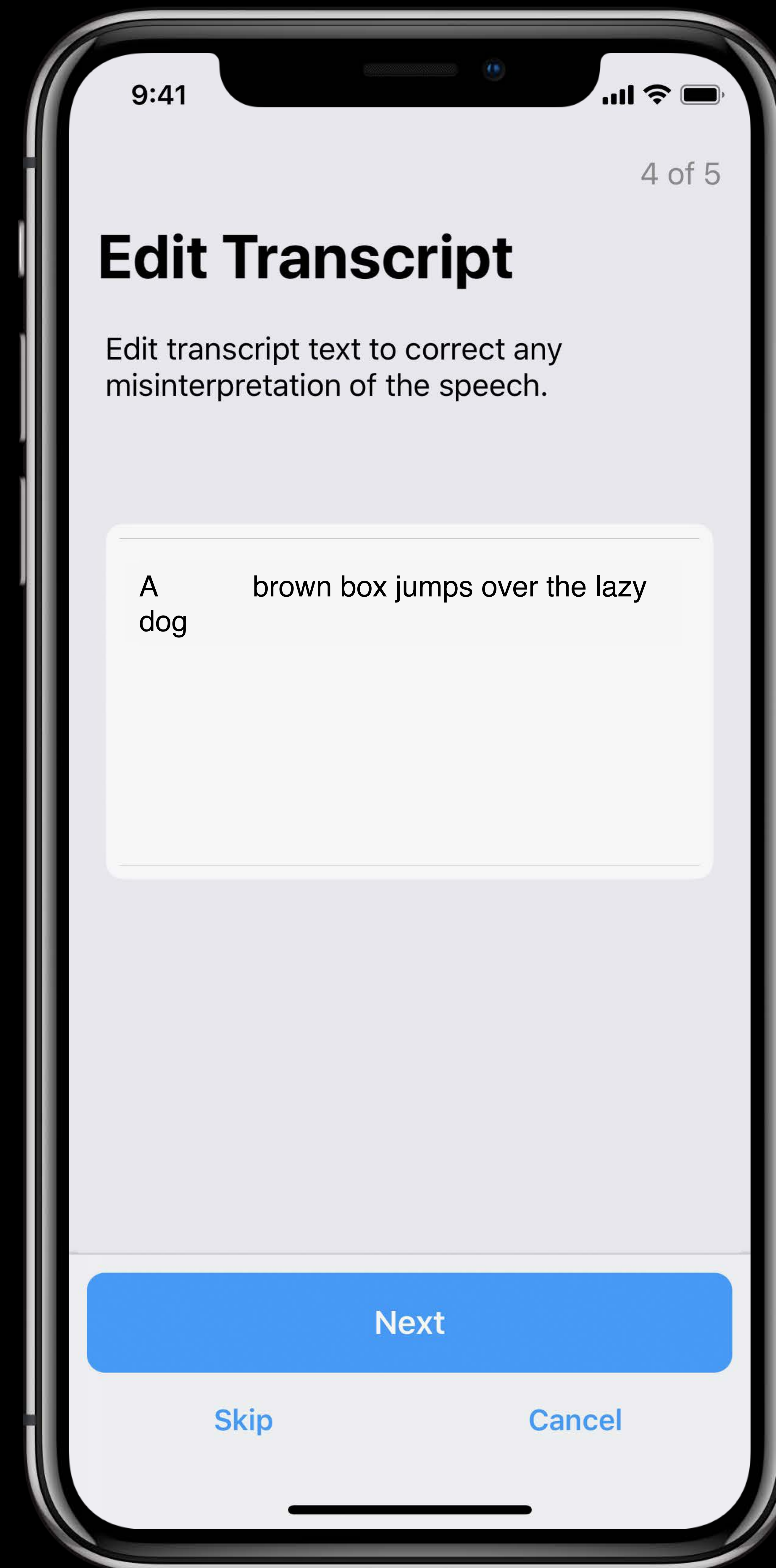
Speech Recognition

A quiet brown box jumps
over the lazy dog



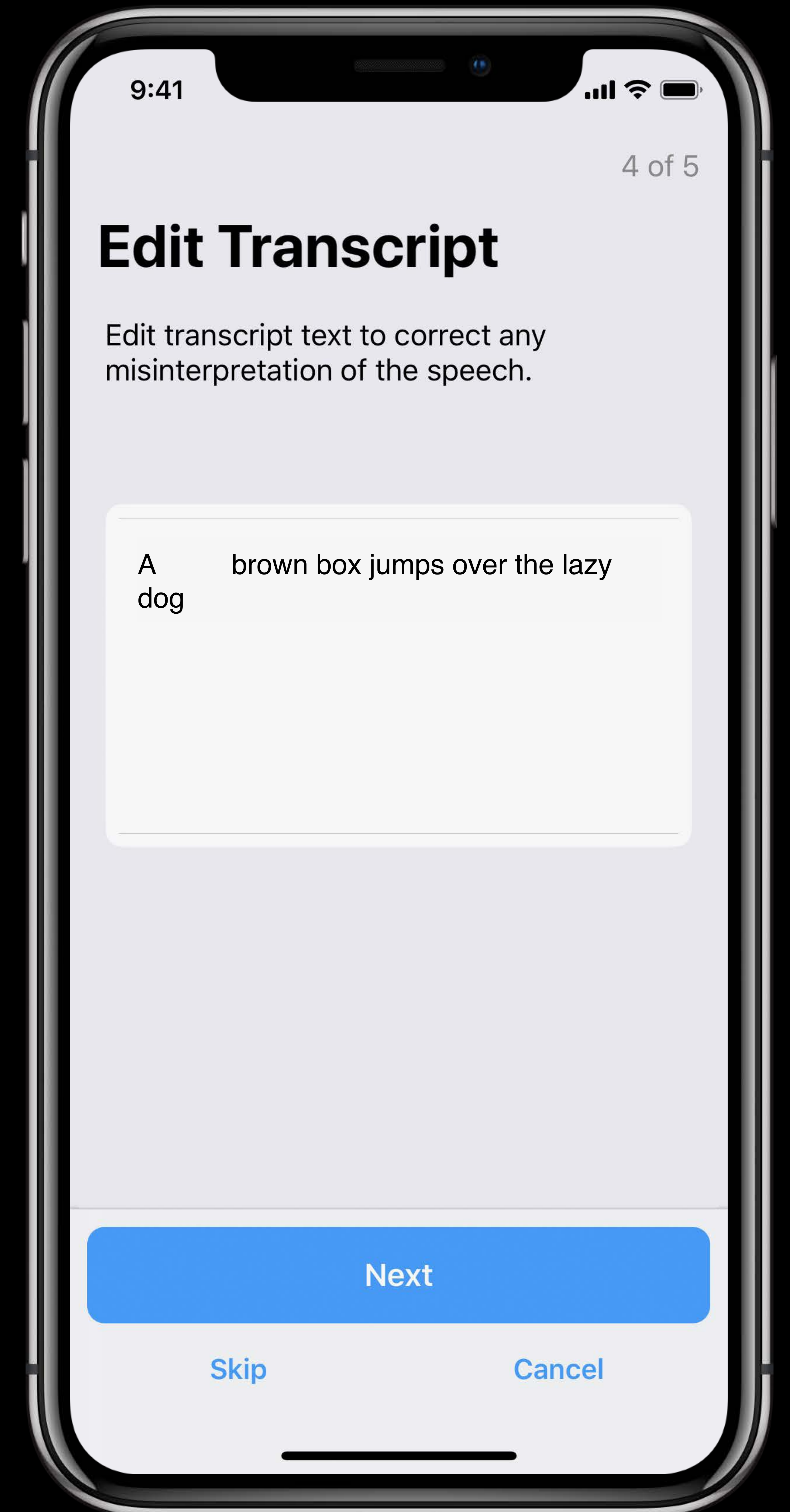
Speech Recognition

A brown box jumps
over the lazy dog



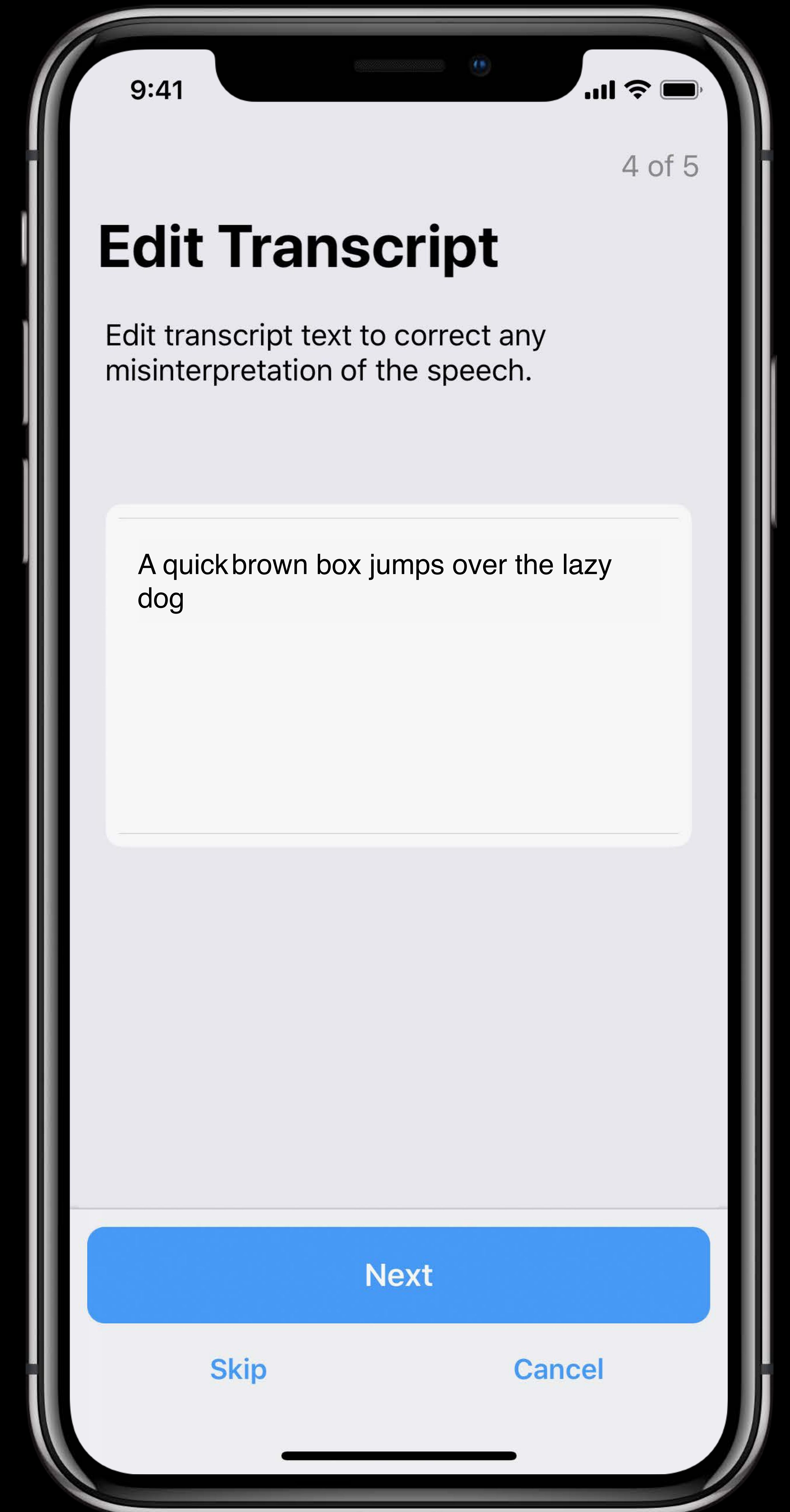
Speech Recognition

A brown box jumps
over the lazy dog



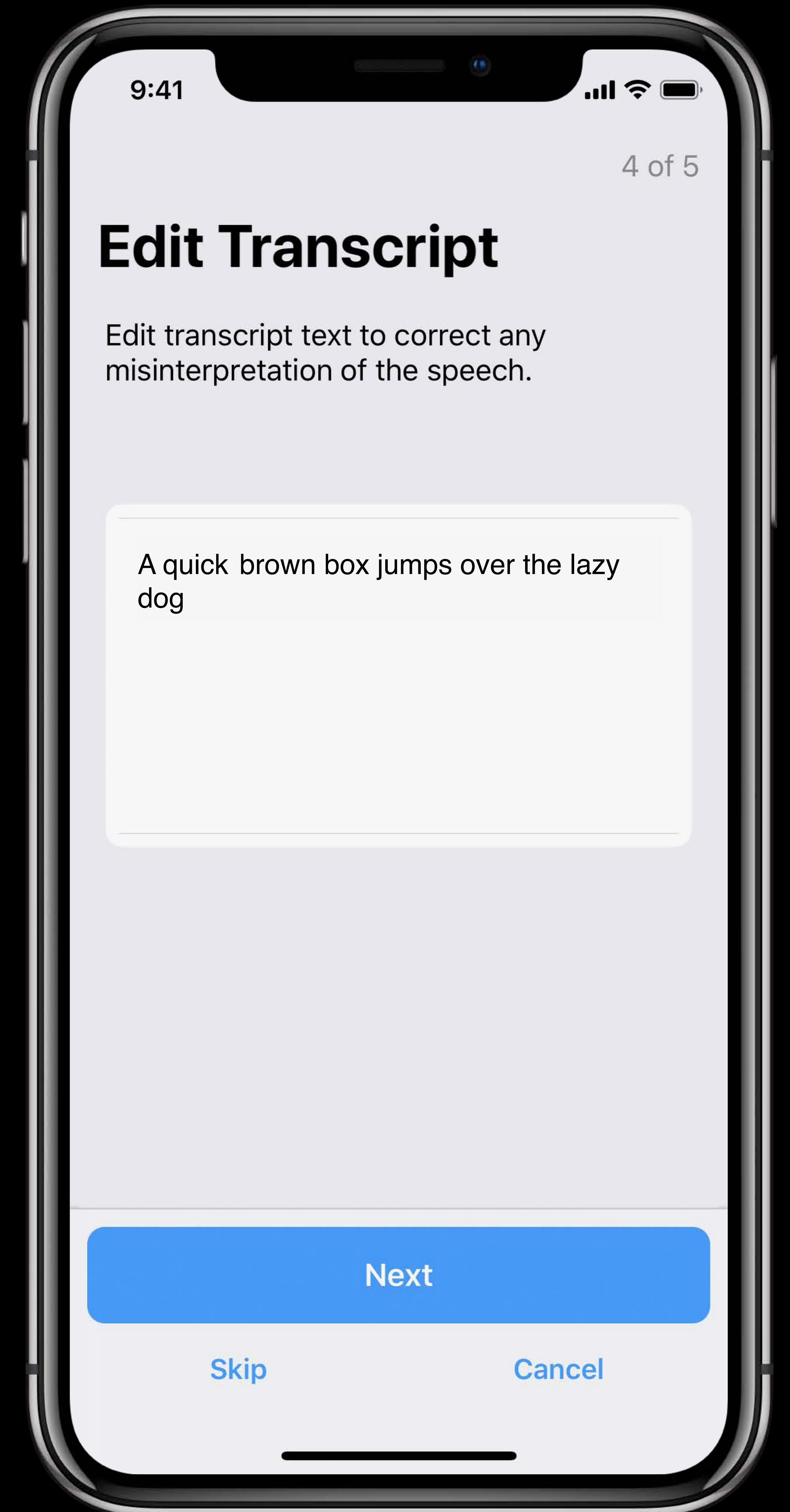
Speech Recognition

A quick brown box jumps
over the lazy dog



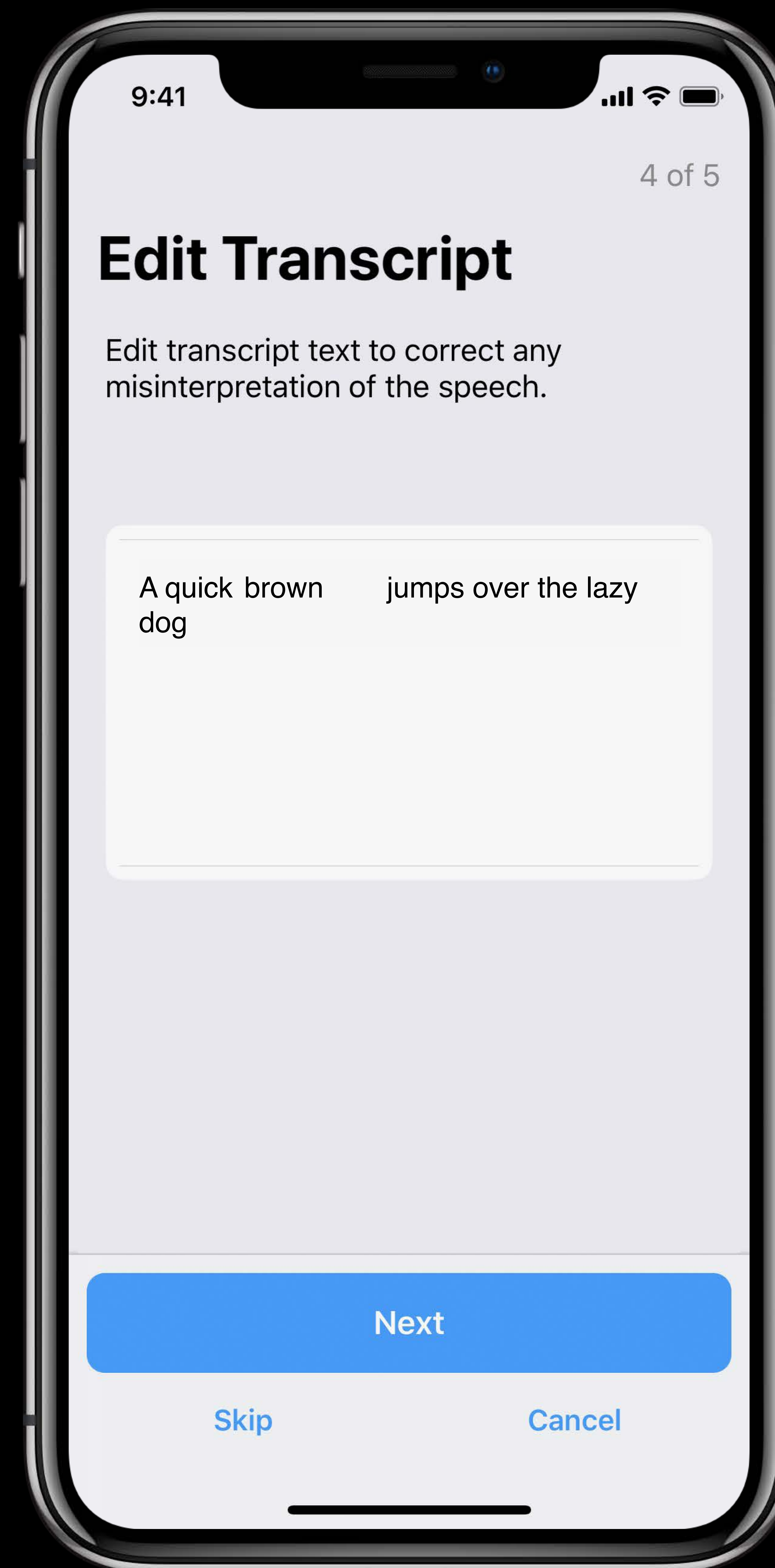
Speech Recognition

A quick brown box jumps
over the lazy dog



Speech Recognition

A quick brown jumps
over the lazy dog



Speech Recognition

A quick brown jumps
over the lazy dog



Speech Recognition

A quick brown fox jumps
over the lazy dog



```
//Speech Recognition Step
```

```
import ResearchKit
```

```
let step = ORKSpeechRecognitionStep(identifier: "speechRecognitionStep",  
                                     image: nil,  
                                     text: "A quick brown fox jumps over the lazy dog")
```

```
//Speech Recognition Step
import ResearchKit

let step = ORKSpeechRecognitionStep(identifier: "speechRecognitionStep",
                                    image: nil,
                                    text: "A quick brown fox jumps over the lazy dog")

step.speechRecognizerLocale = .englishGB
step.shouldHideTranscript = false
```

```
Result {  
    formattedString  
    [ Segment ]  
}
```

Result { ... }

Segment {

substring

range

timeStamp

duration

confidence

[Alternative]

}

Result { ... }

Segment { ... }

Alternative [

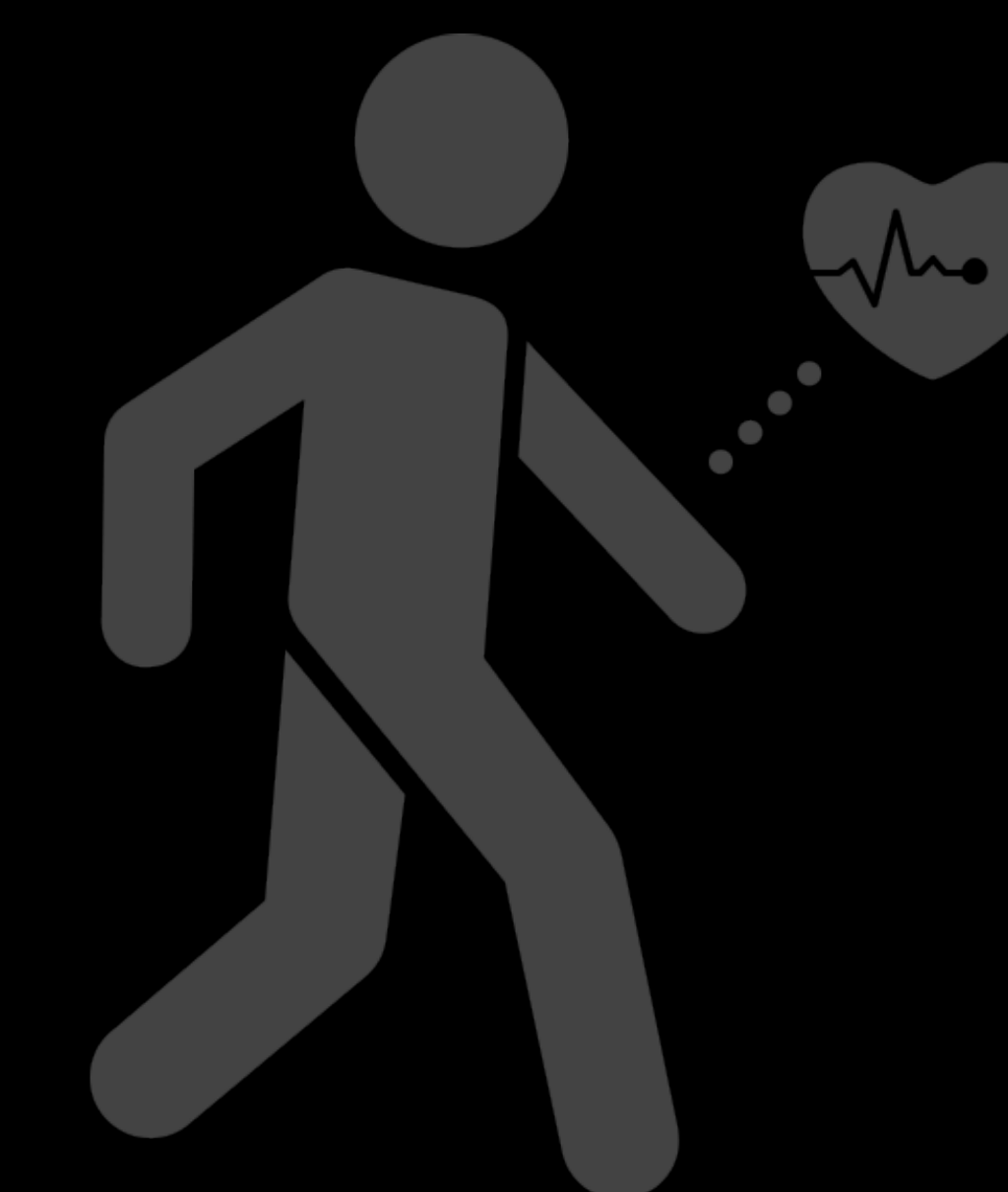
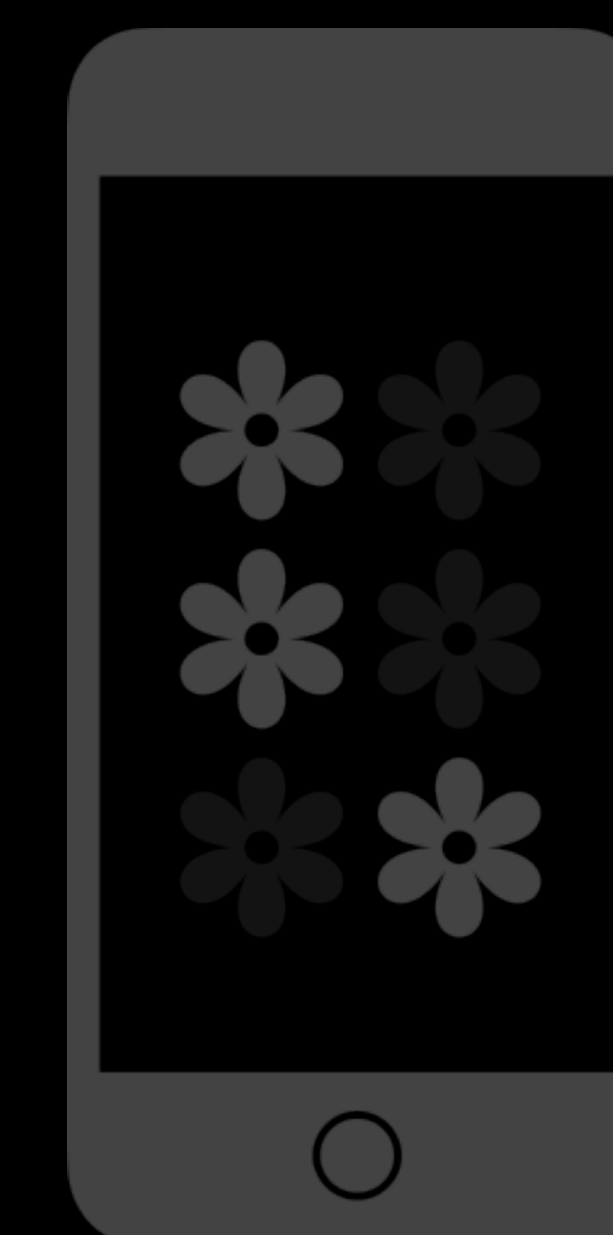
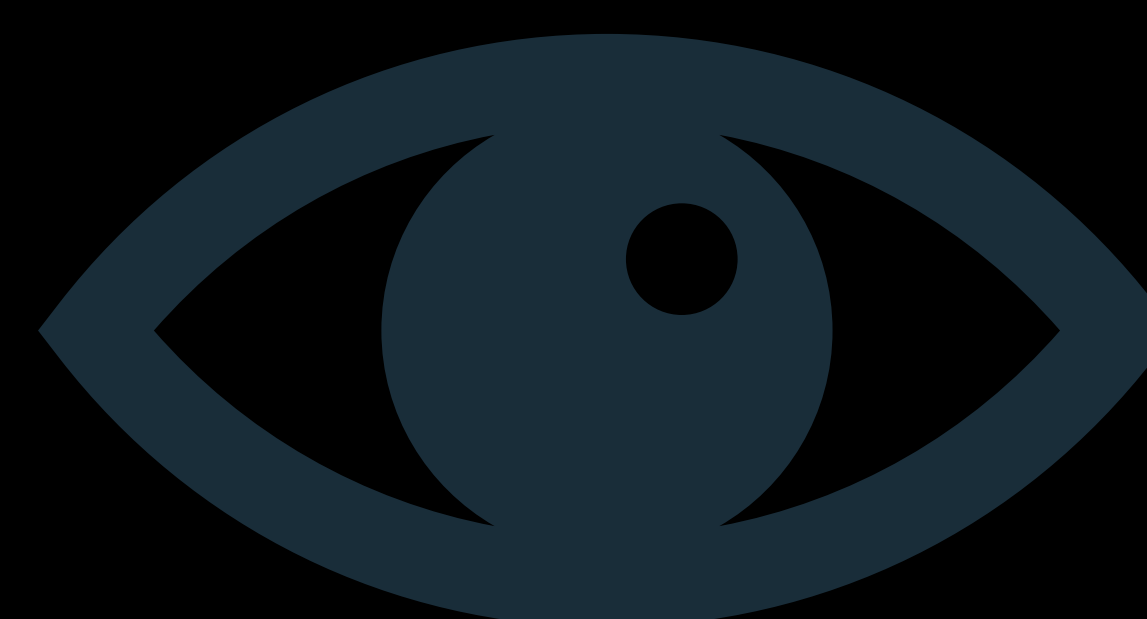
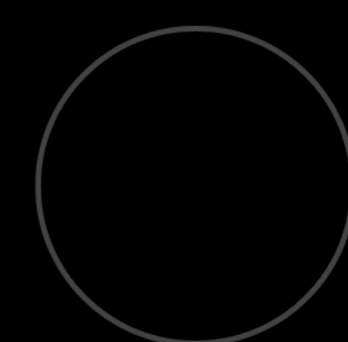
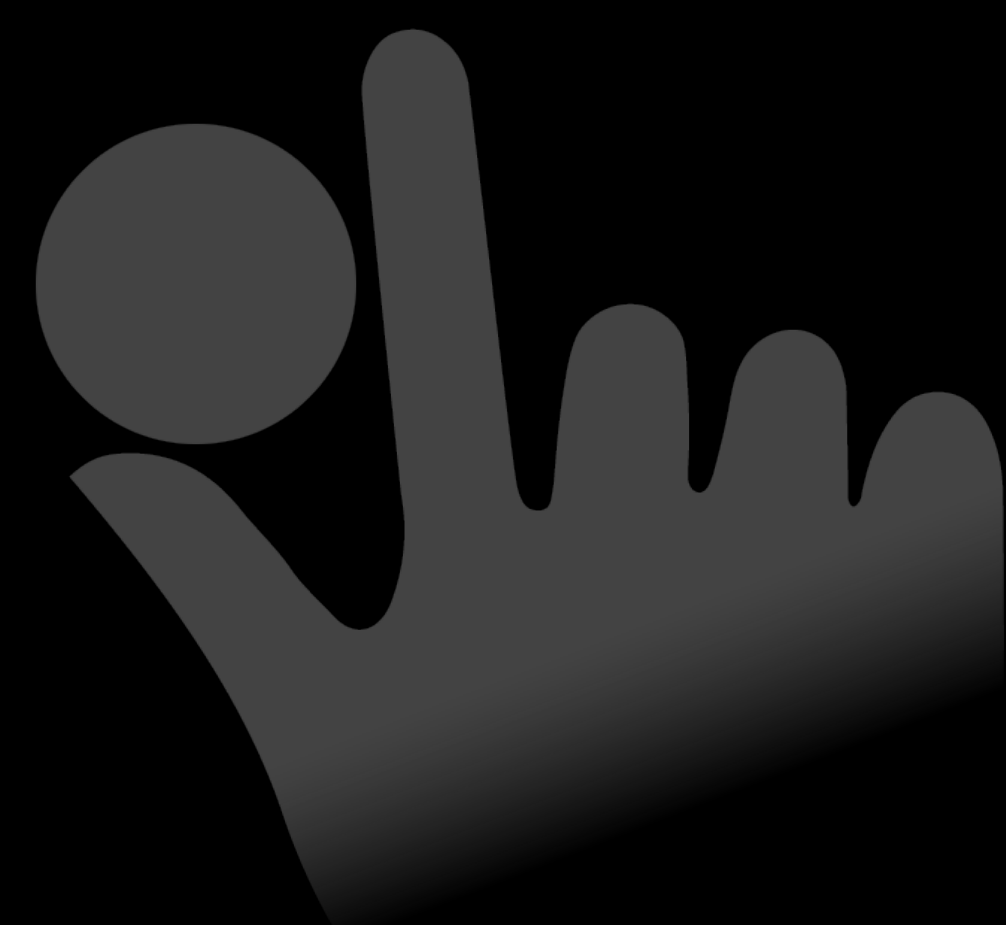
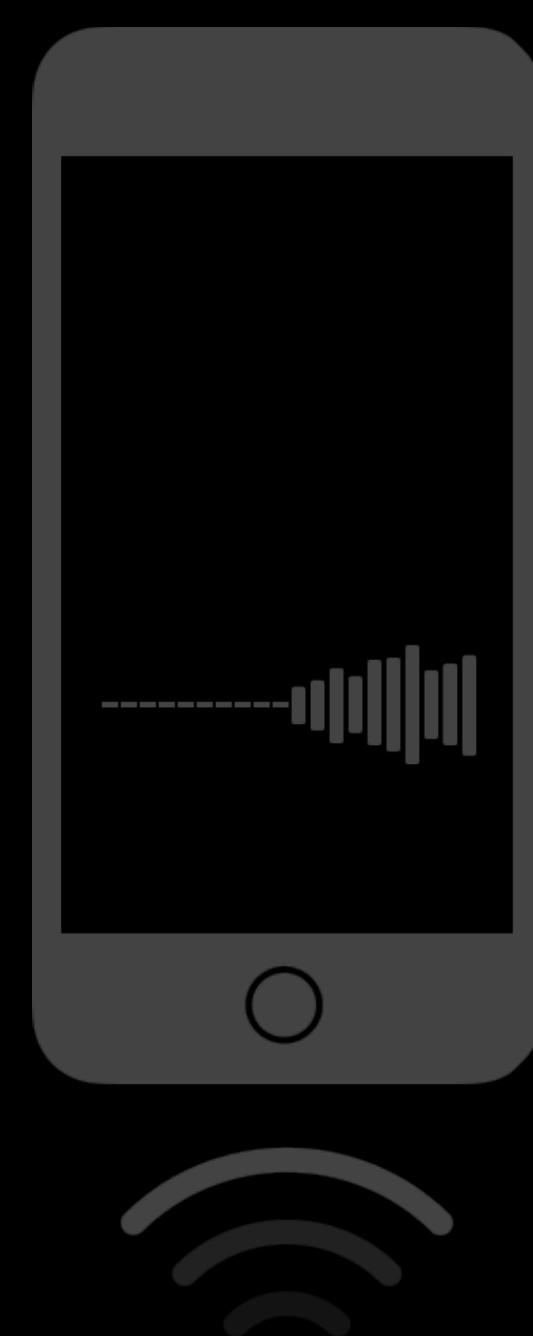
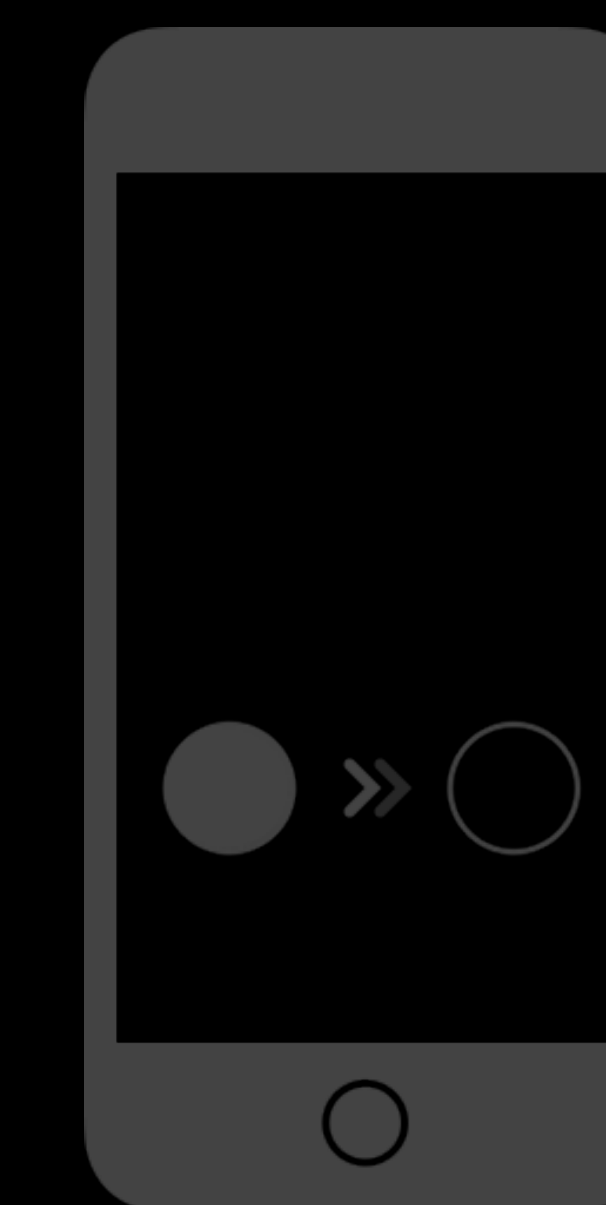
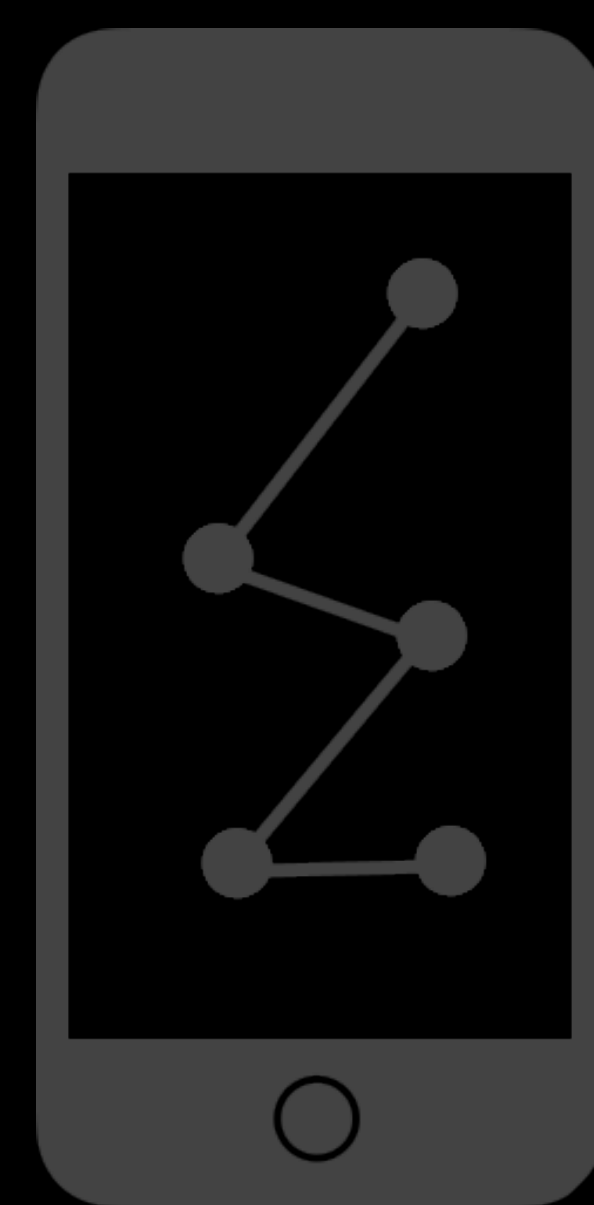
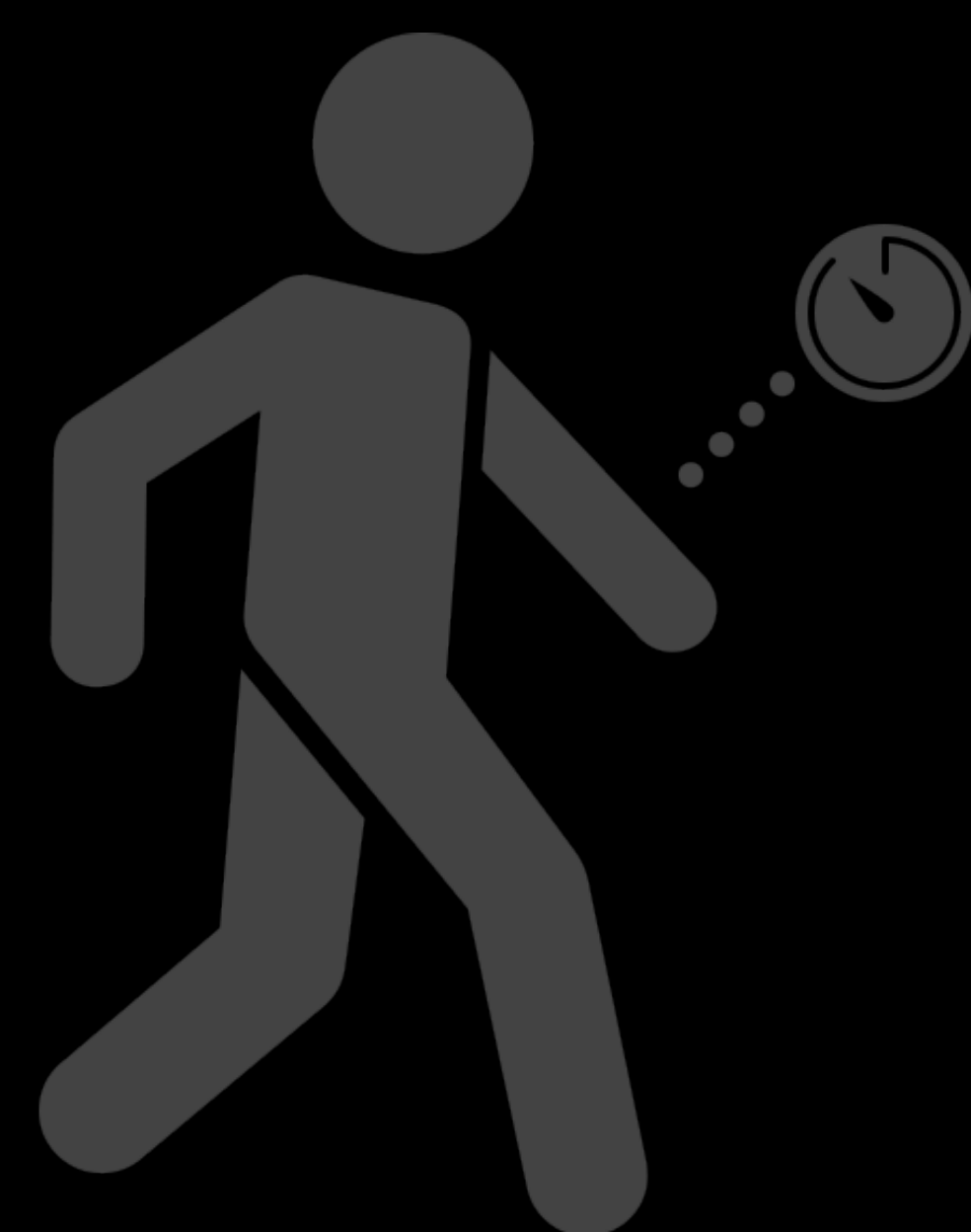
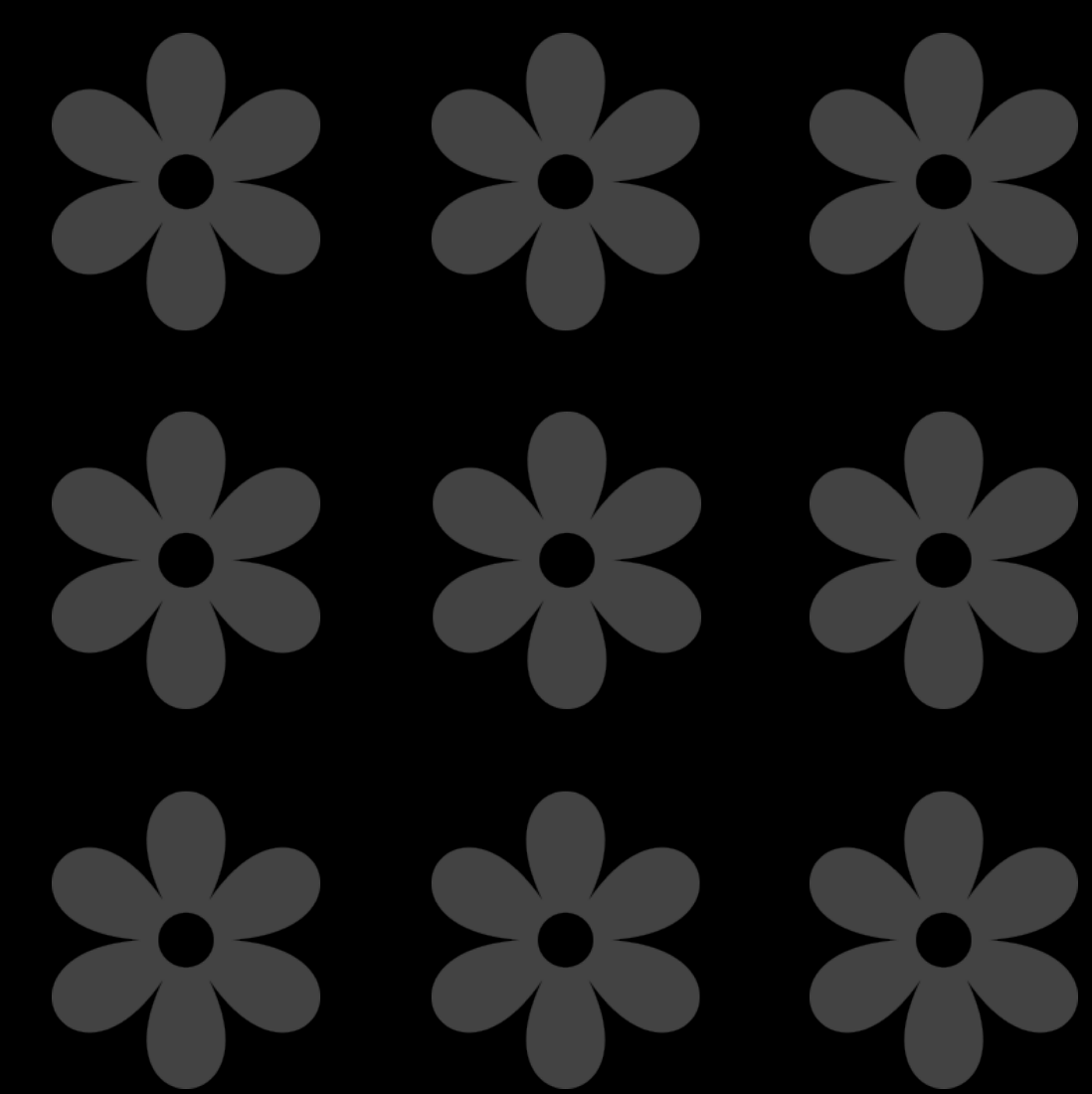
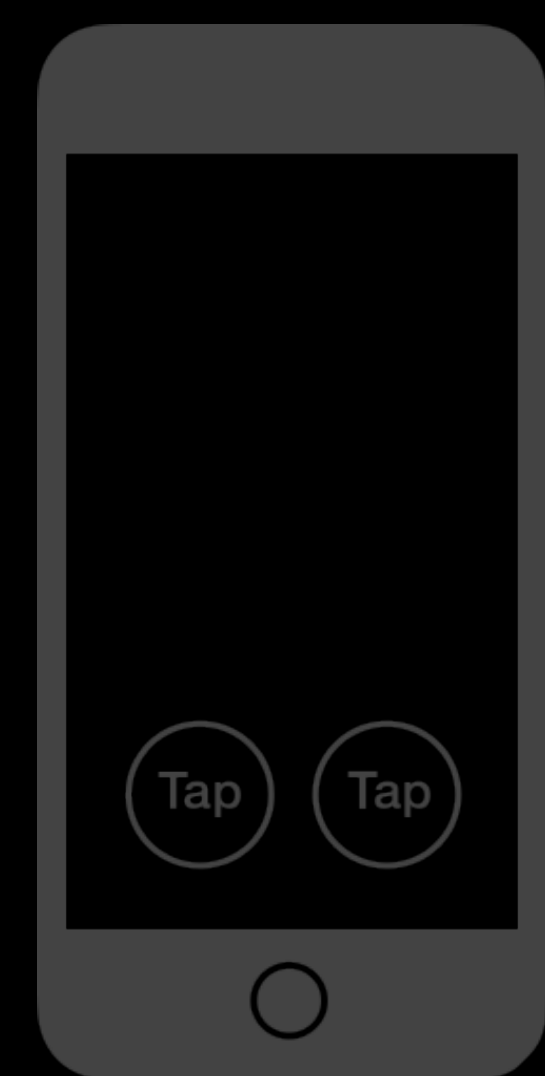
“Kelsey”

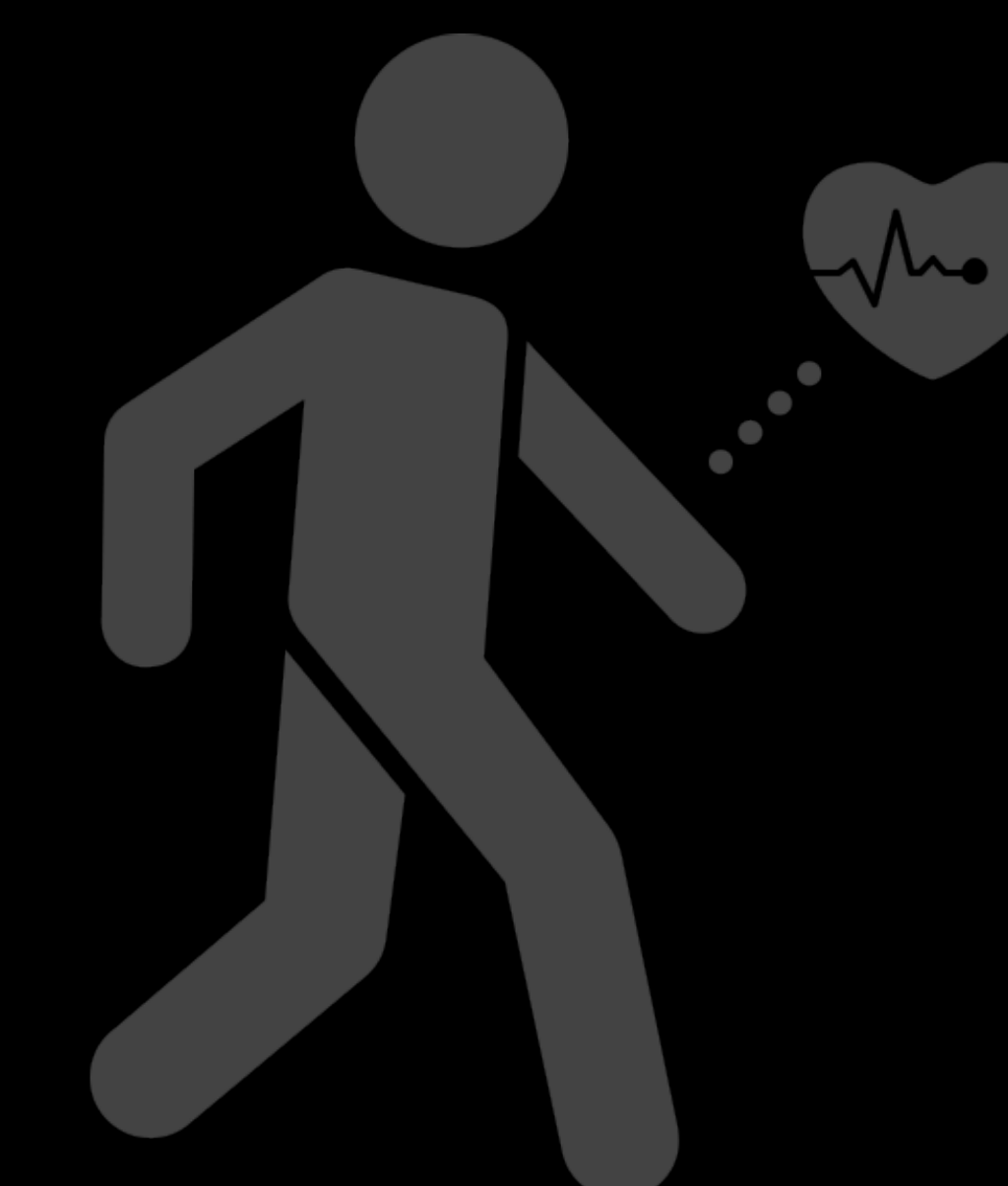
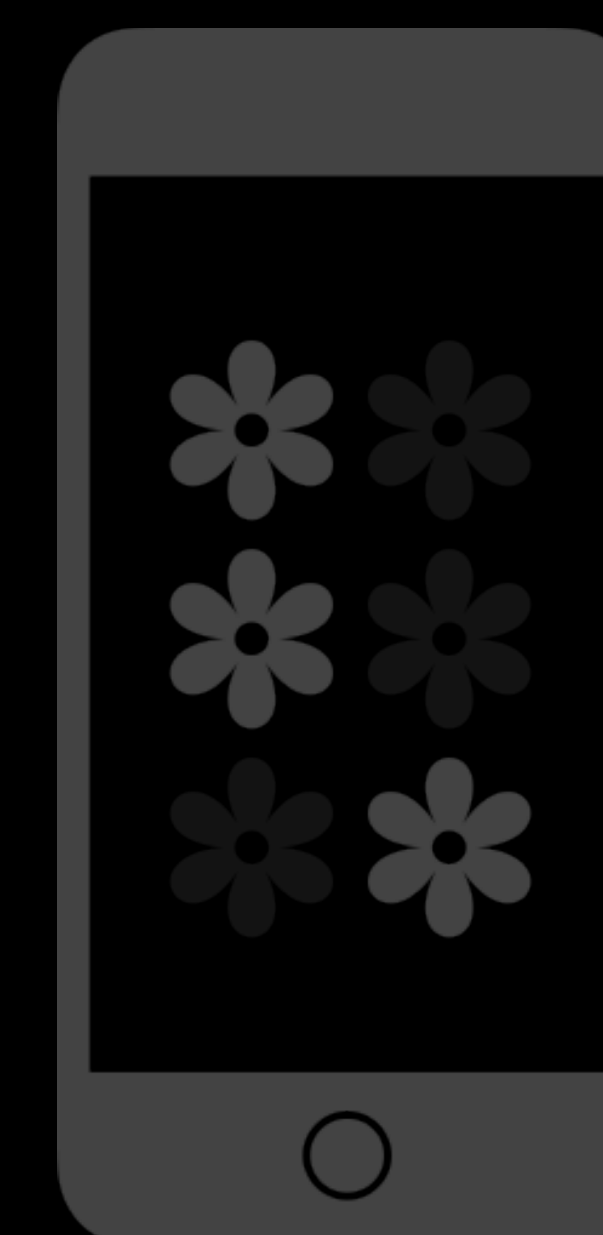
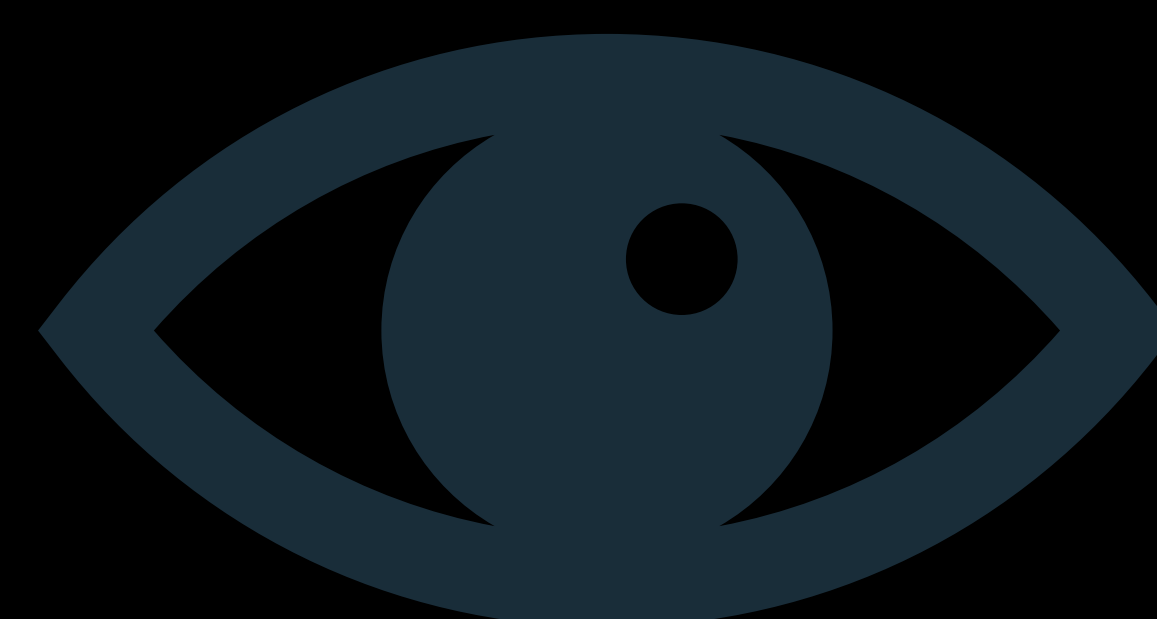
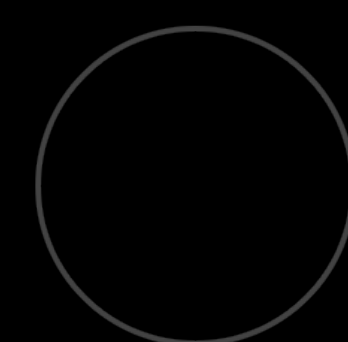
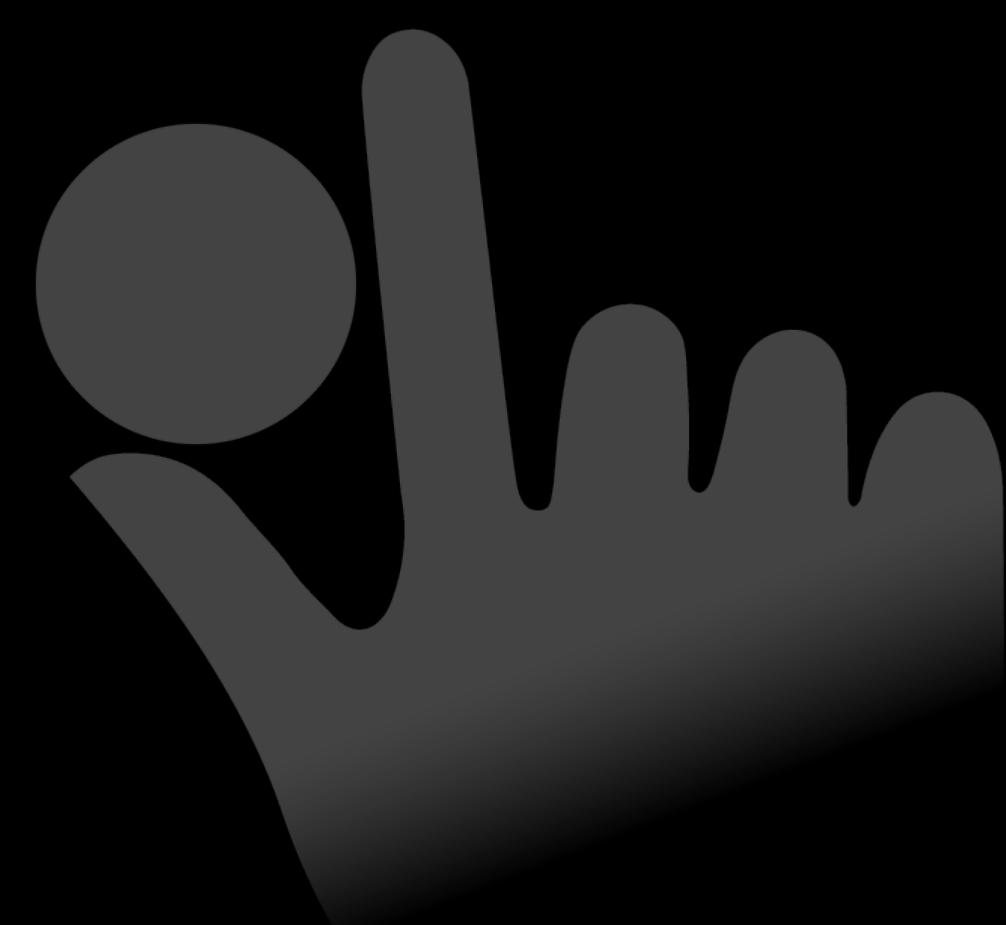
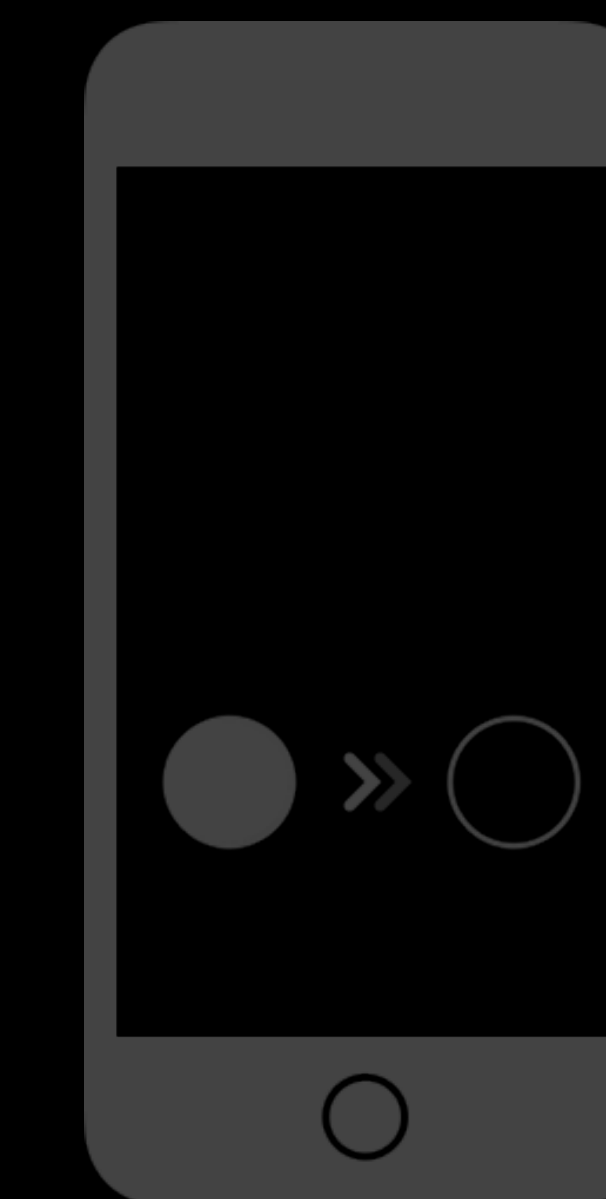
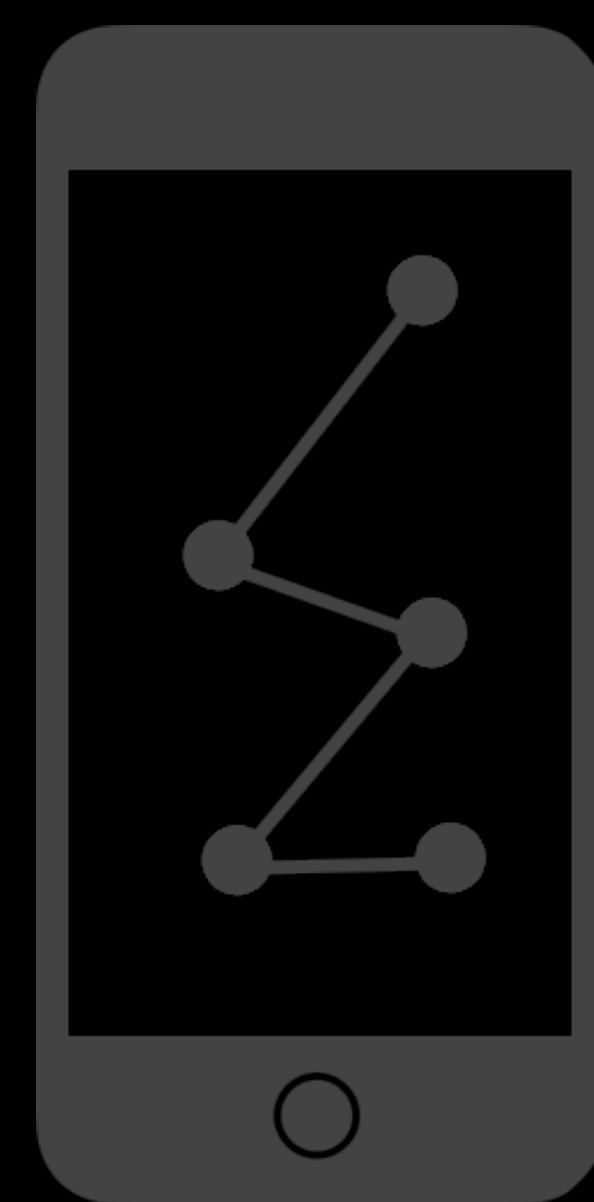
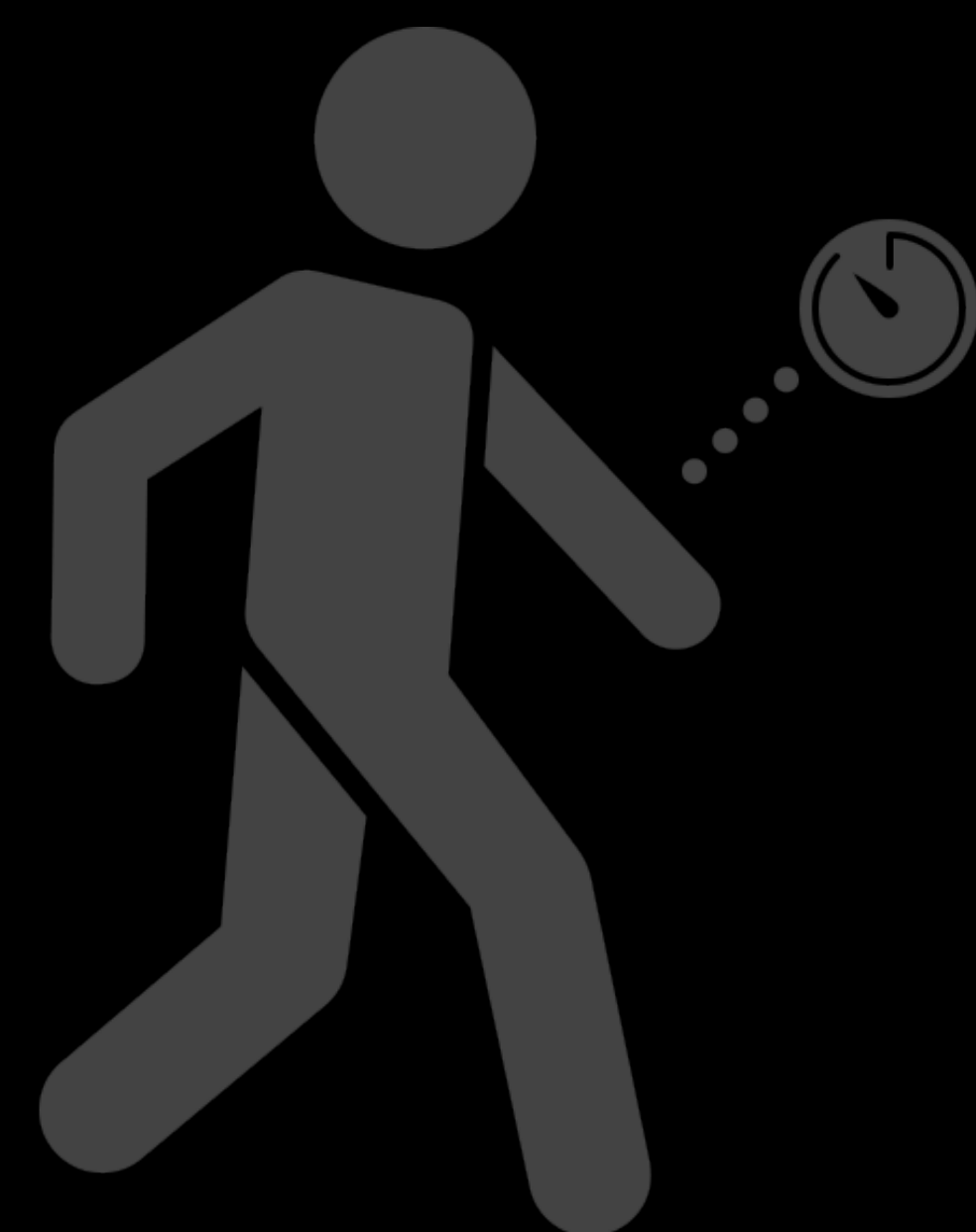
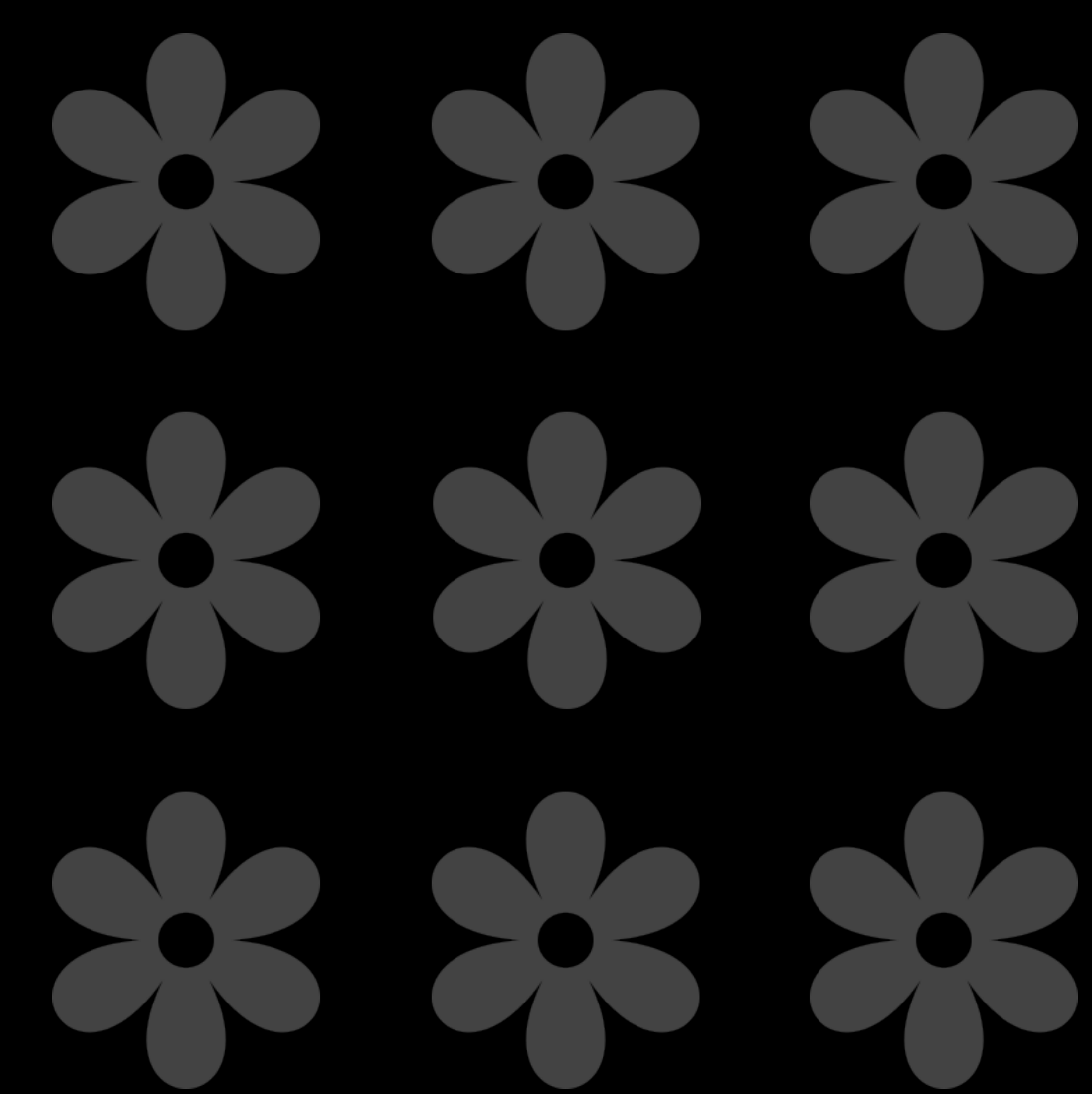
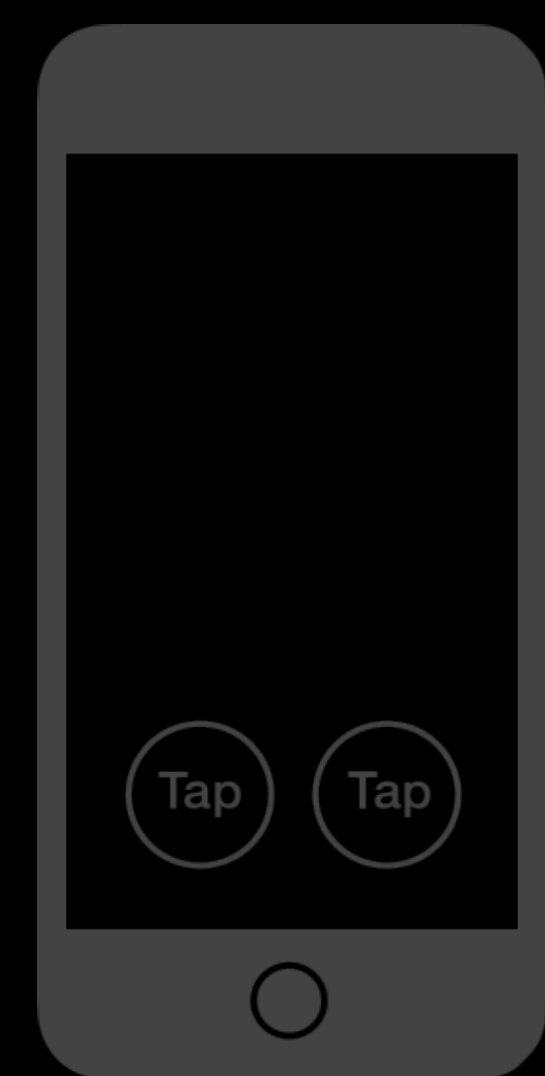
“Chelsea”

“Kelsie”

“Celgie”

]





Speech in Noise

Speech Audiometry

- Identify hidden hearing loss
- Complements Tone Audiometry
- Determine Speech Reception Threshold (SRT)



9:41



3 of 7

Speech in Noise

* Listen to the audio recording and pay attention to the sentence that you hear.

* Repeat the sentence you heard or skip ahead to type the sentence using the keyboard.

* You will have the option to modify the transcript generated by the speech engine at the end.



Next

Cancel

9:41



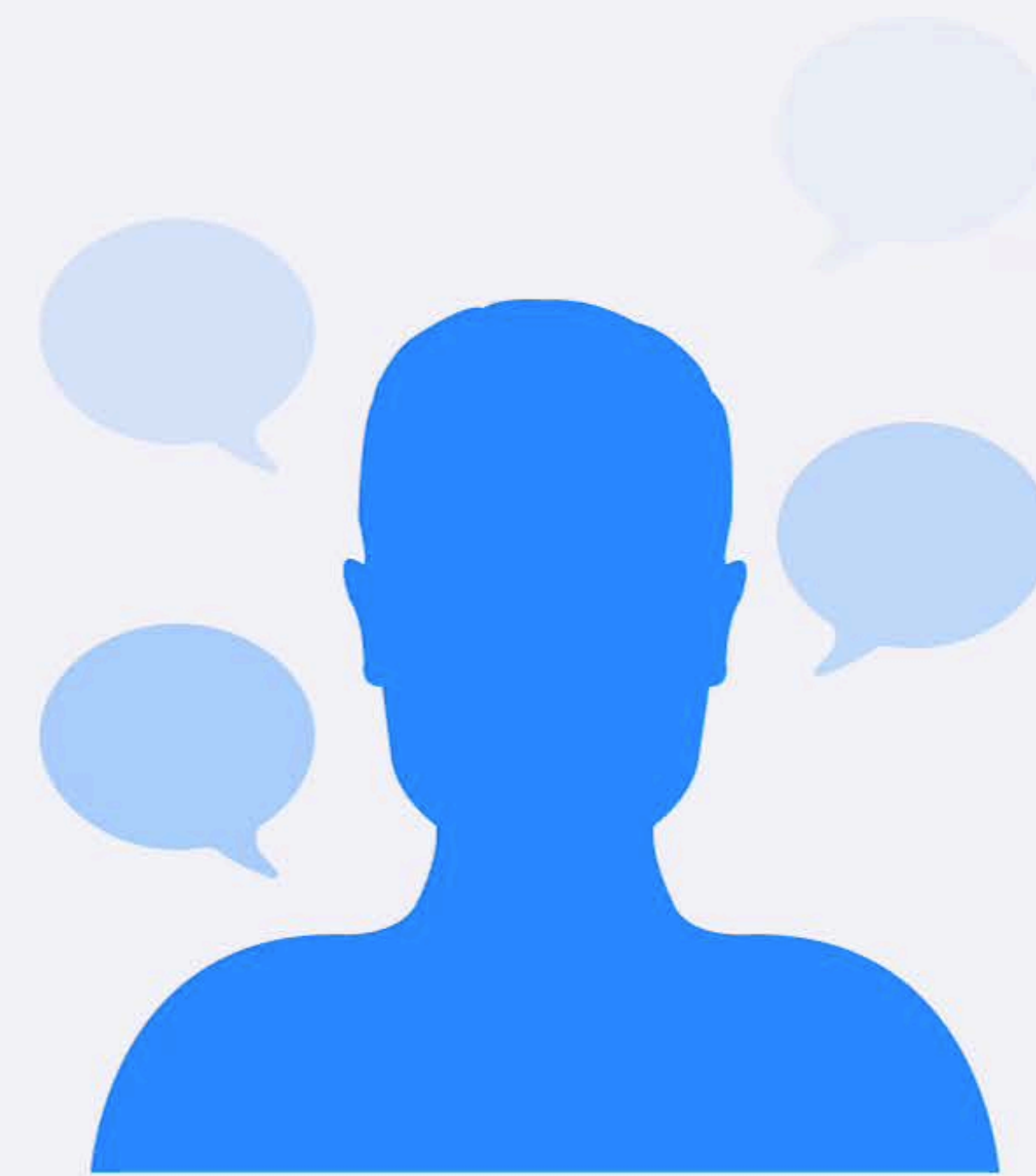
3 of 7

Speech in Noise

* Listen to the audio recording and pay attention to the sentence that you hear.

* Repeat the sentence you heard or skip ahead to type the sentence using the keyboard.

* You will have the option to modify the transcript generated by the speech engine at the end.



Next

Cancel

Chuck burnt the toast again!

I am going for a run later
do you want to join me?

Do you want to grab dinner next week?

Kayla and Trey are ordering pizza again.

Jason says it's just typing.

Did someone say cake?

Hi Mom, how are you and Dad doing?

Kelsey do you still

Yea, I am going on vacation next
week. Looking forward to seeing

have chocolate at

some of my family that I have not
had a chance to see in years.

your desk?

Sam and I are going to lunch

town tomorrow. Welcome to

Of course Devin broke something again!

Brett, did you get peanut butter pretzels?

WWDC 2018

**The actor tried three green pictures
The father took four new items
The actor kept three green bags**

WWDC 2018

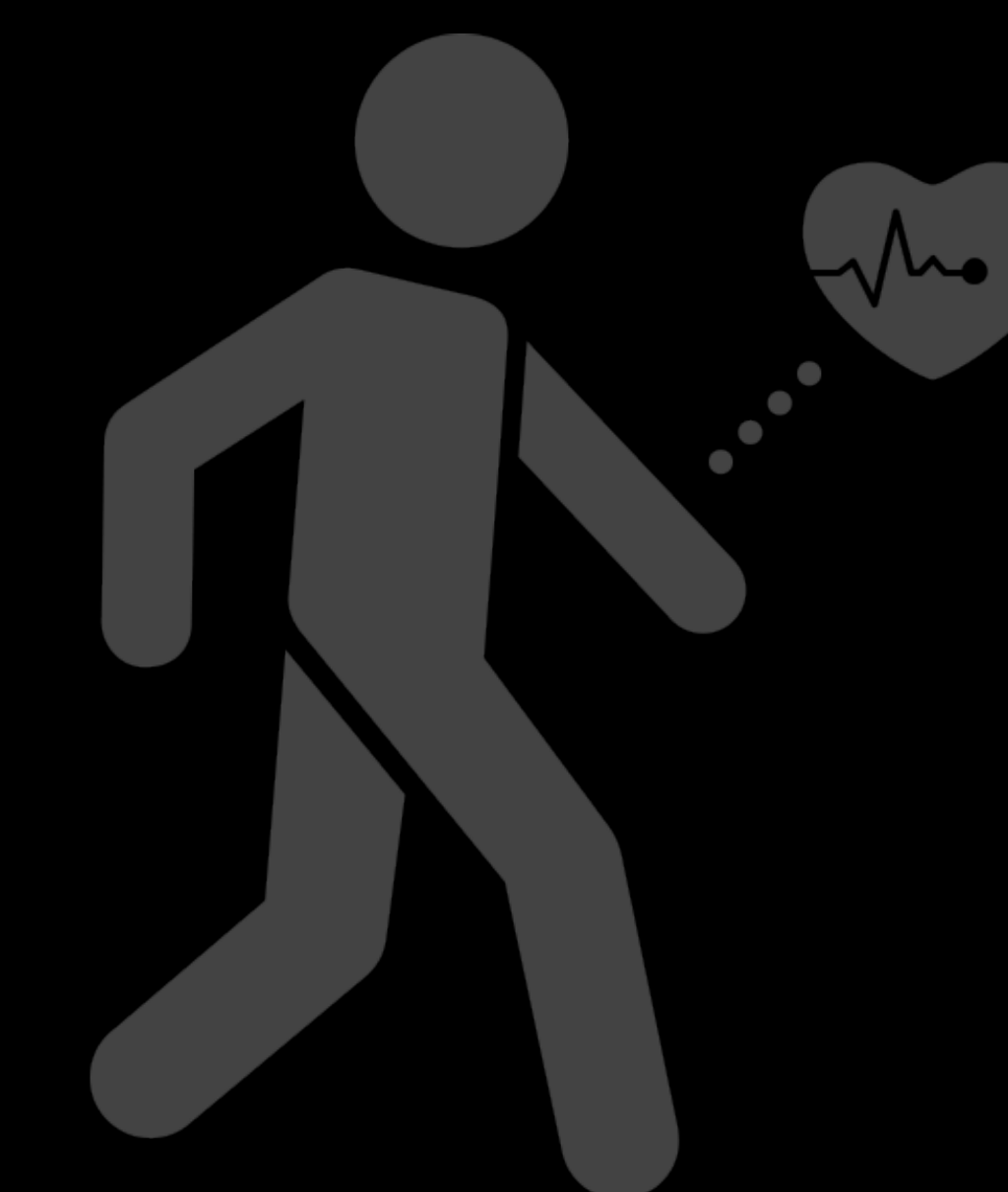
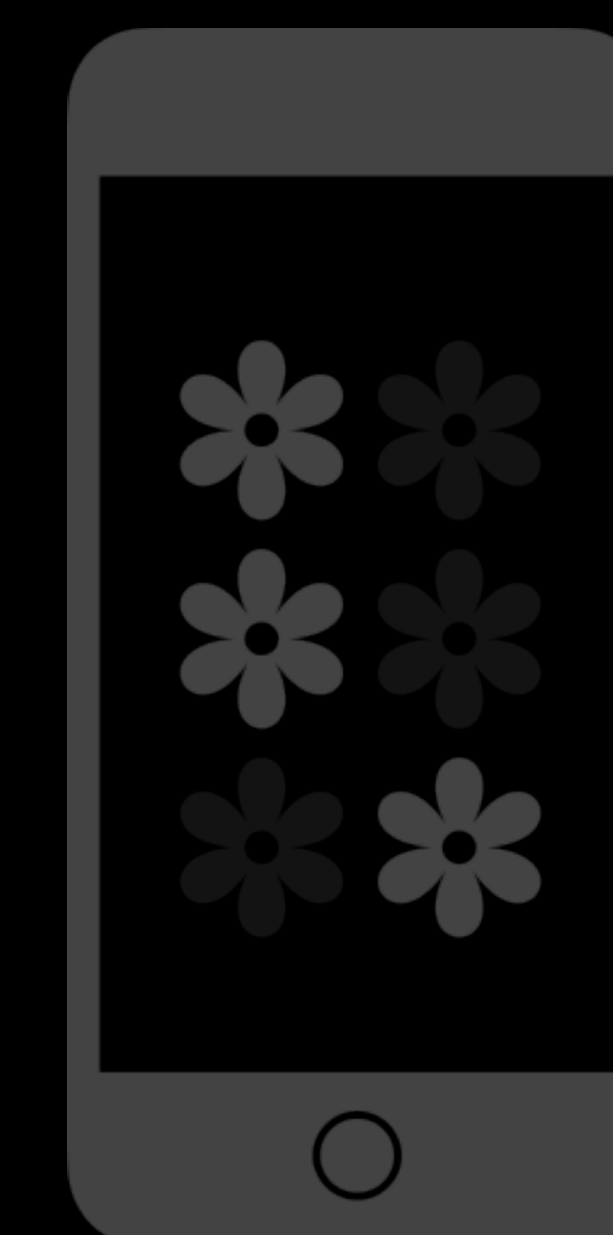
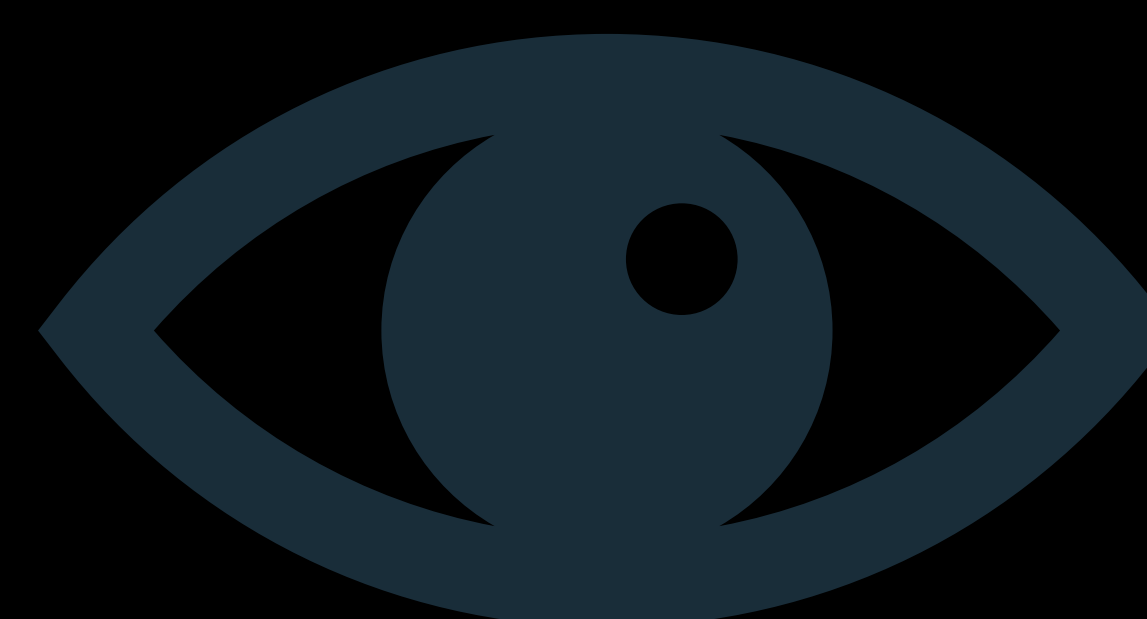
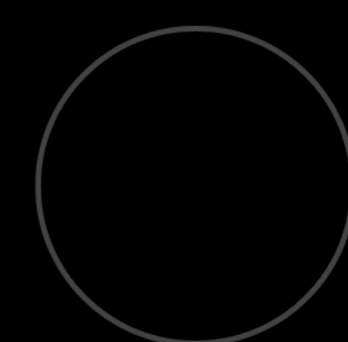
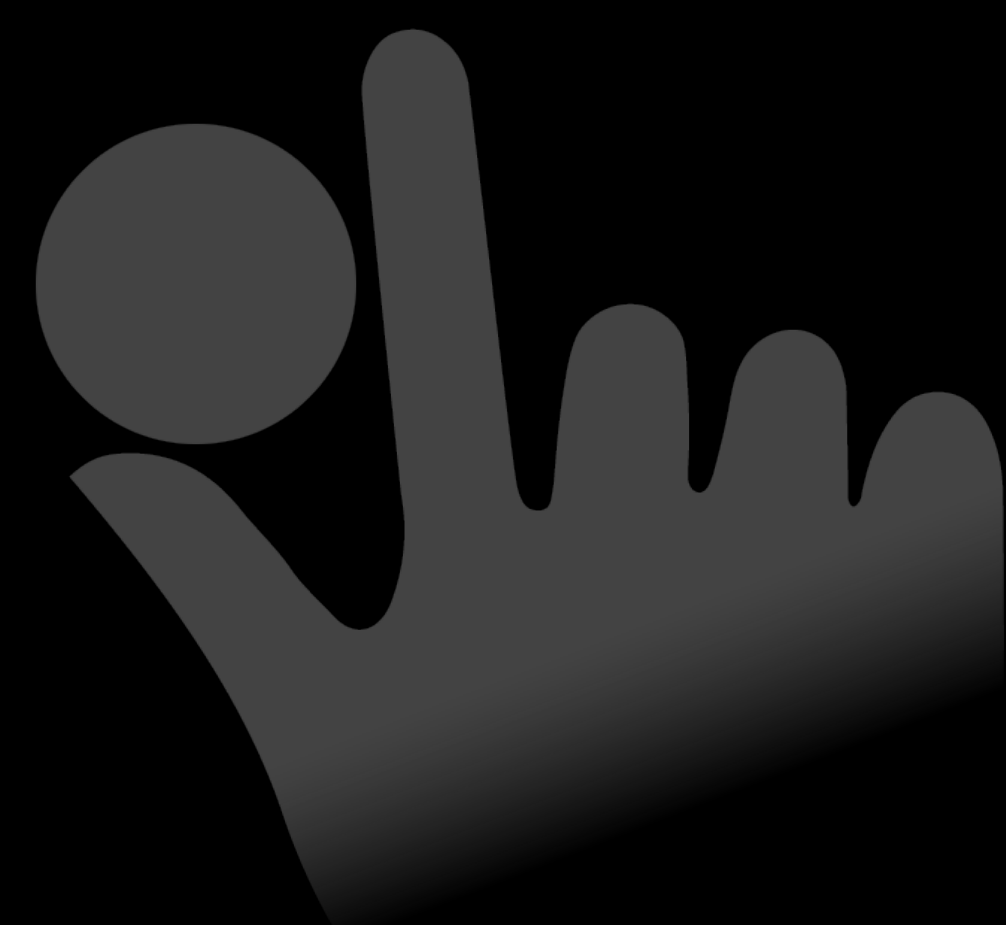
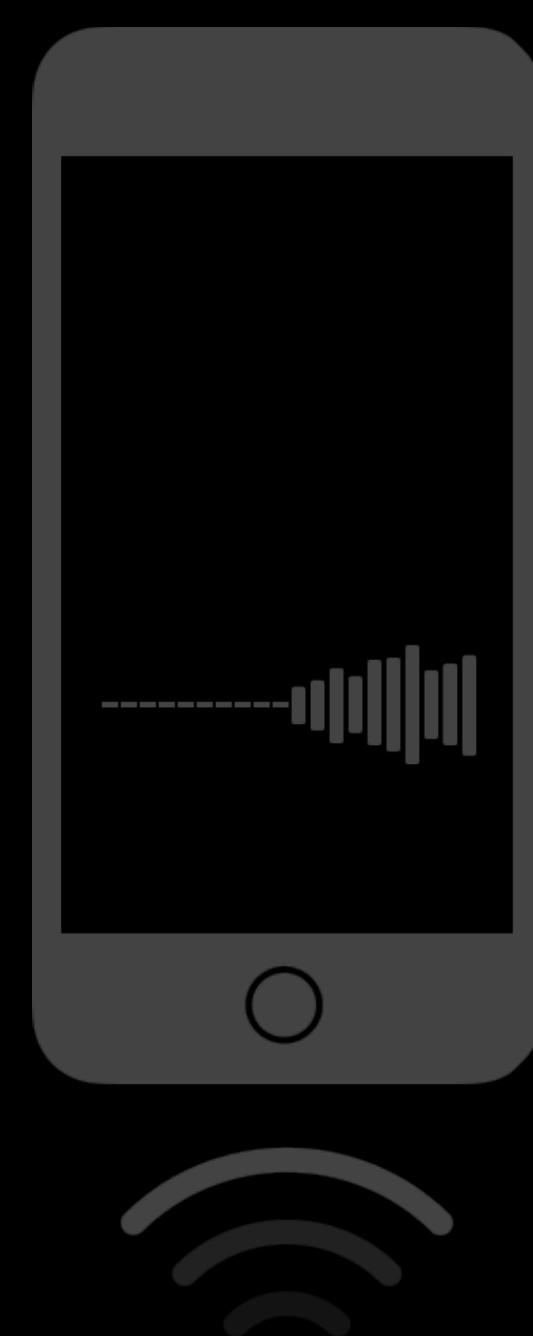
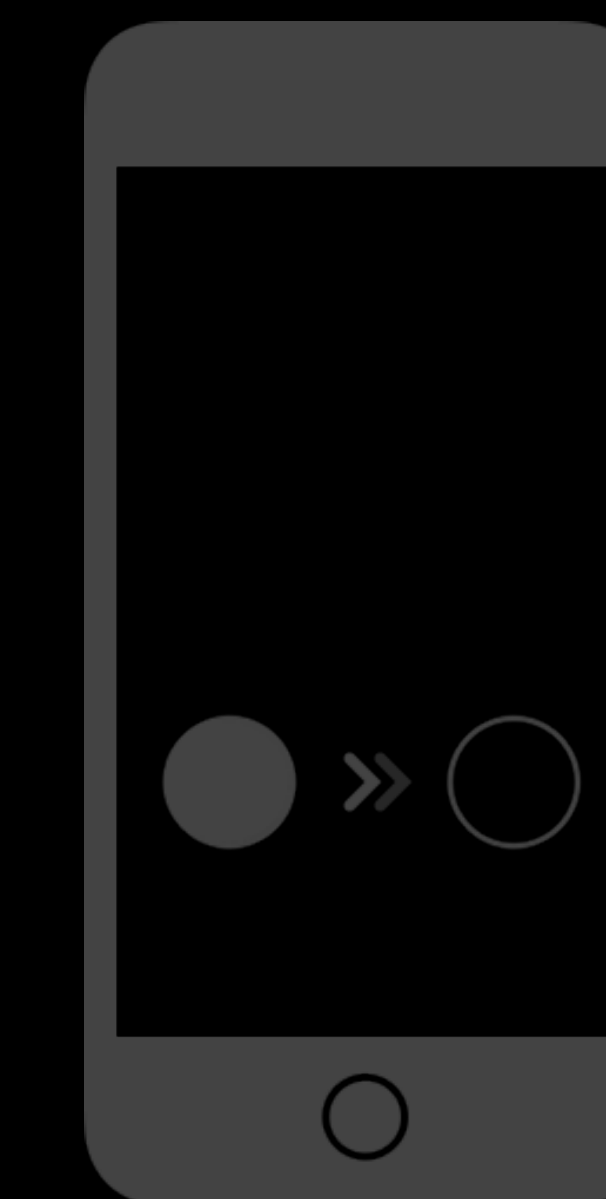
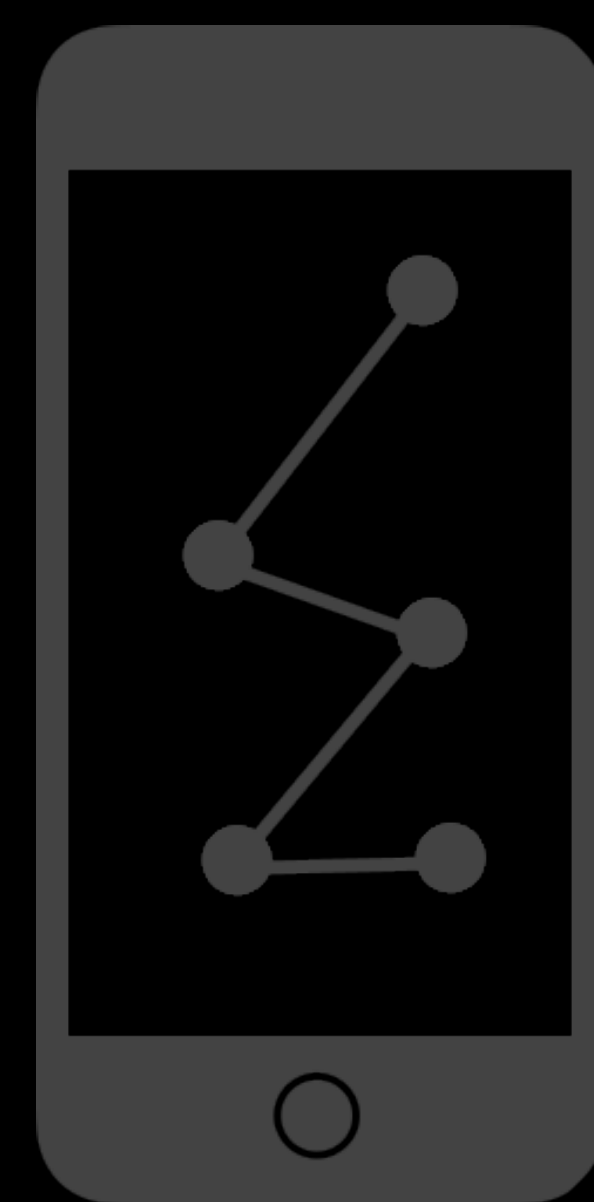
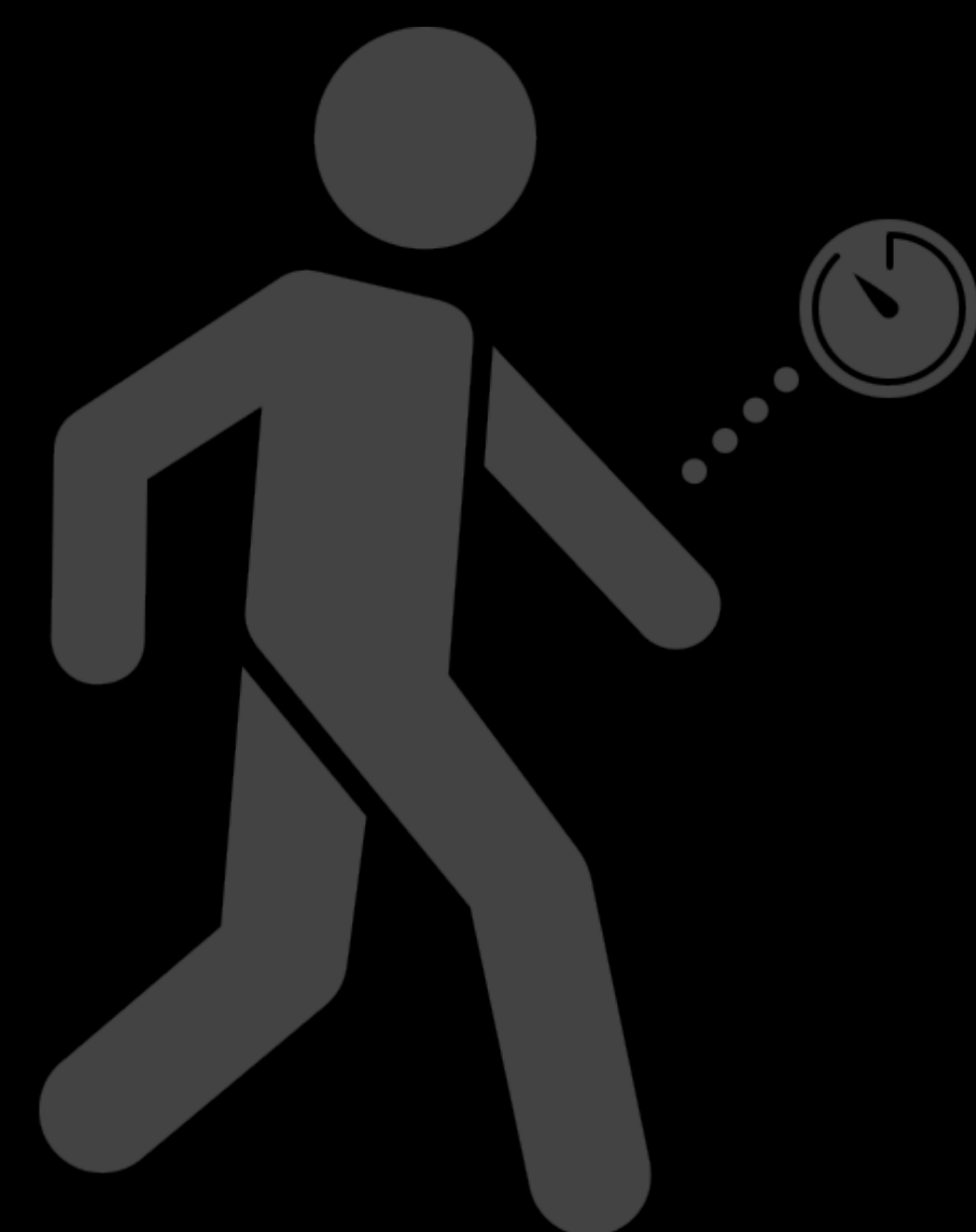
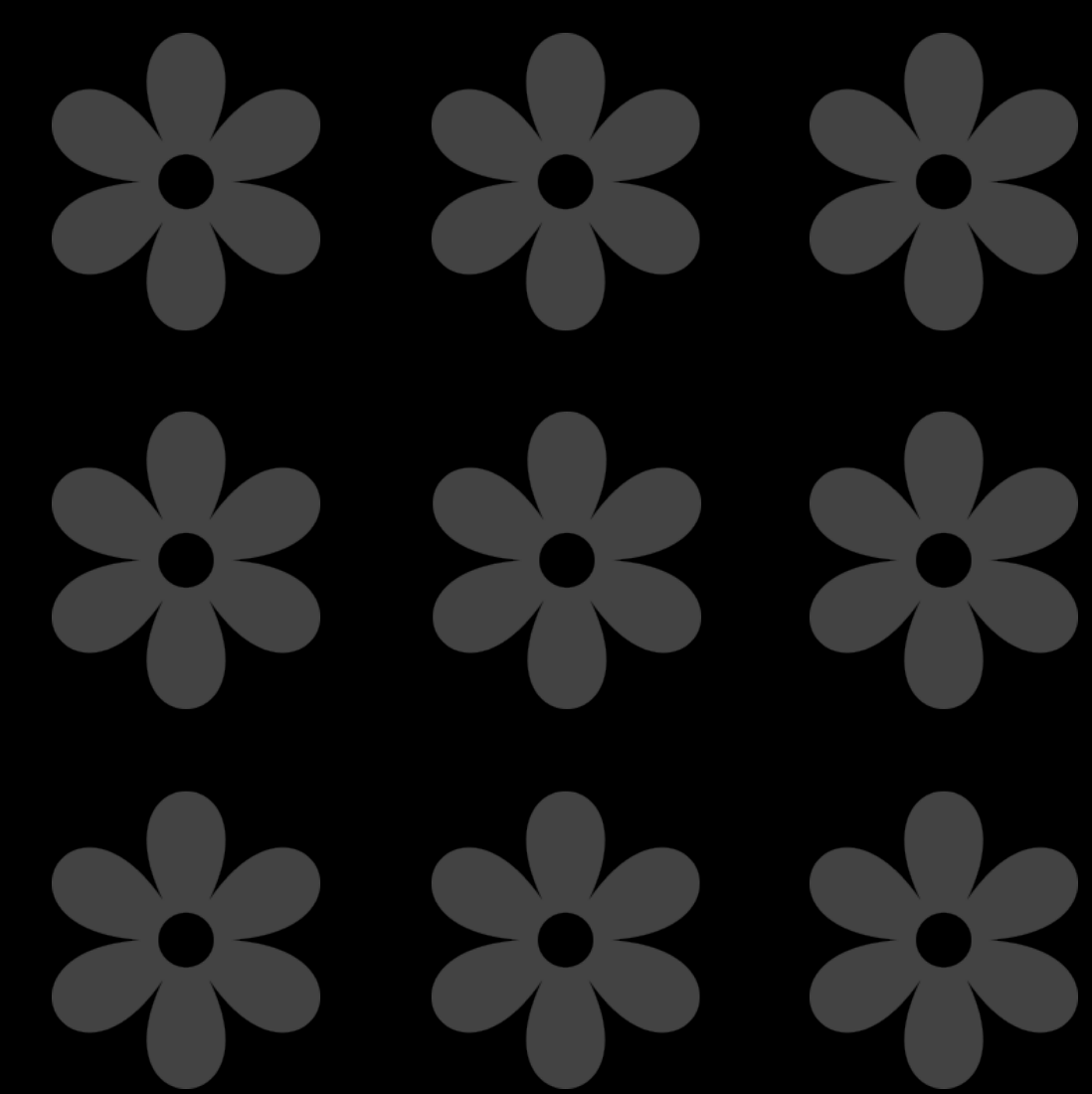
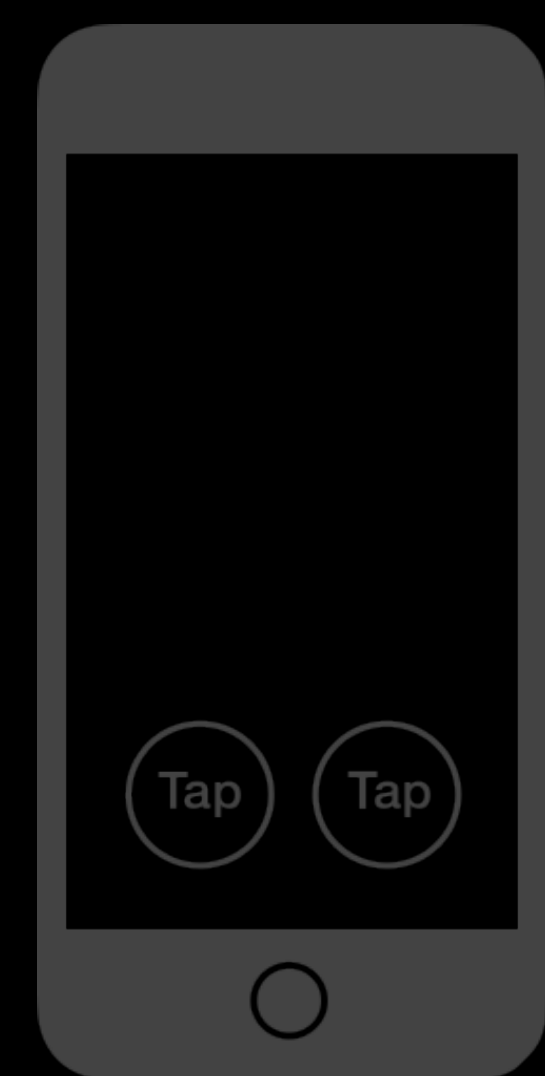

```
//Speech in Noise Step
```

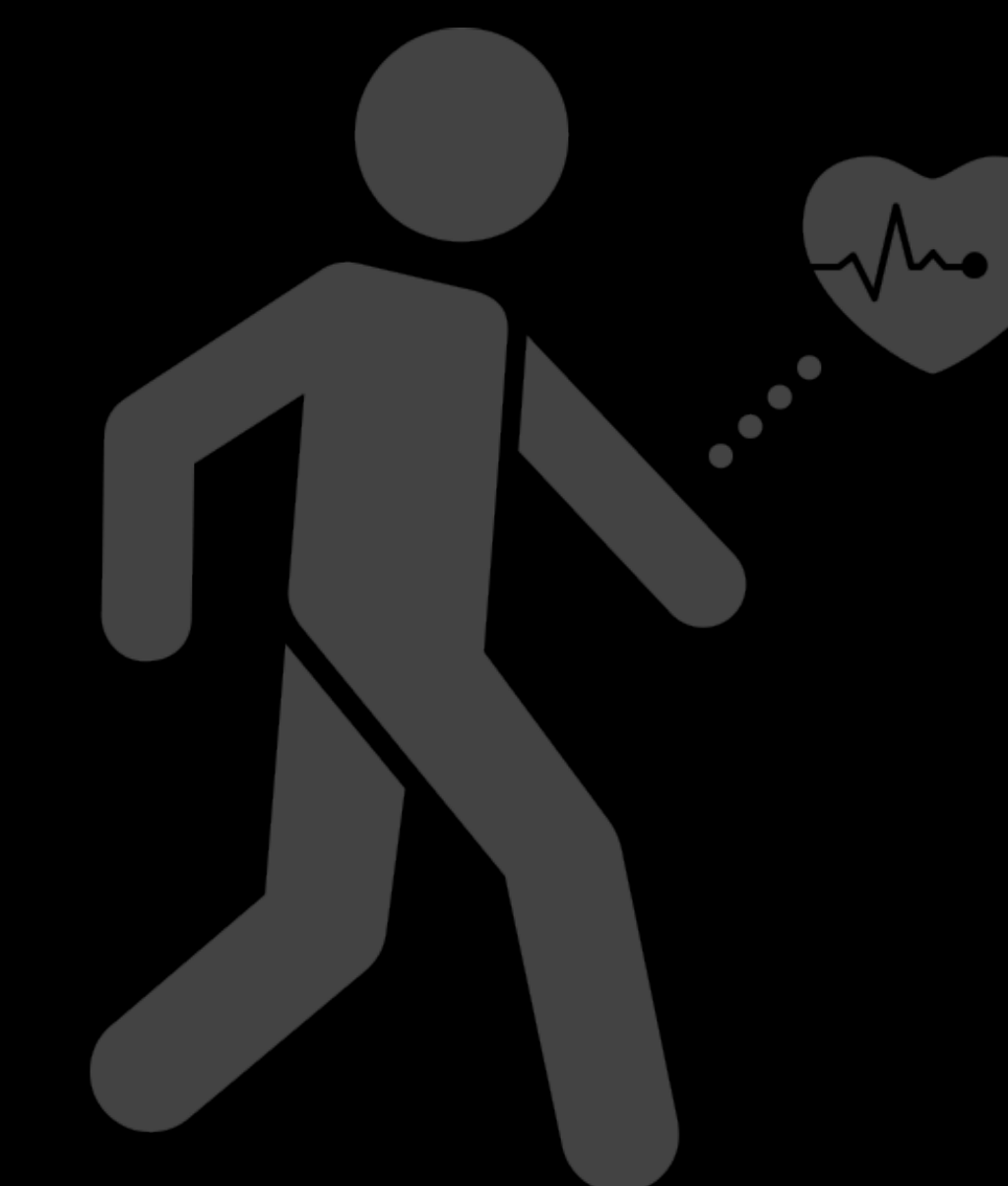
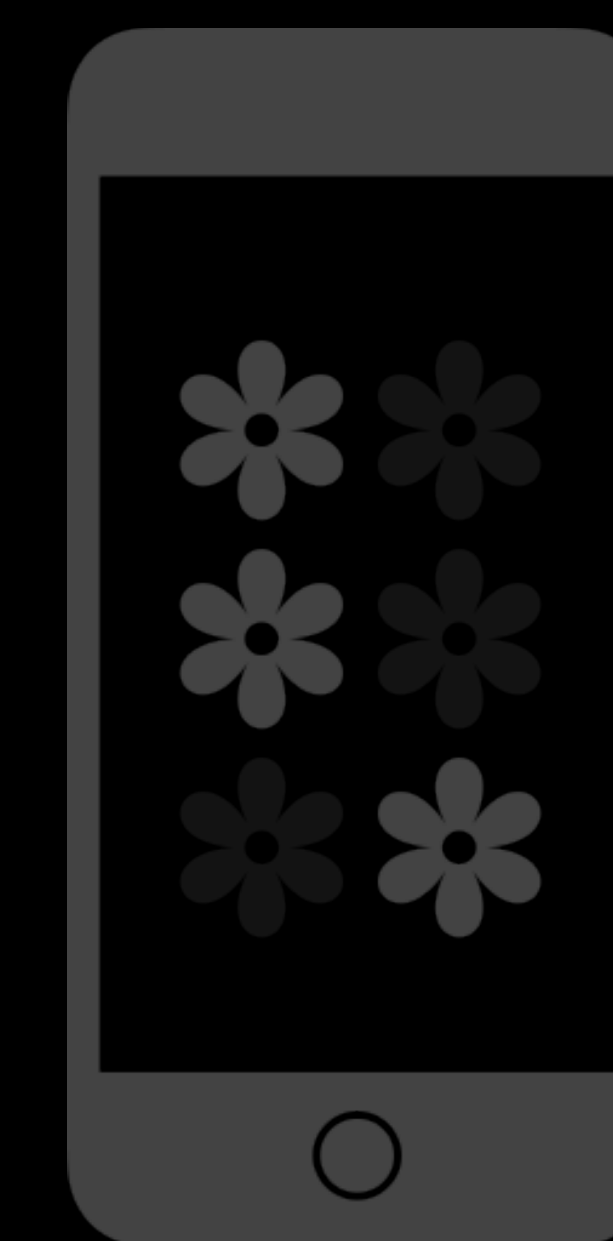
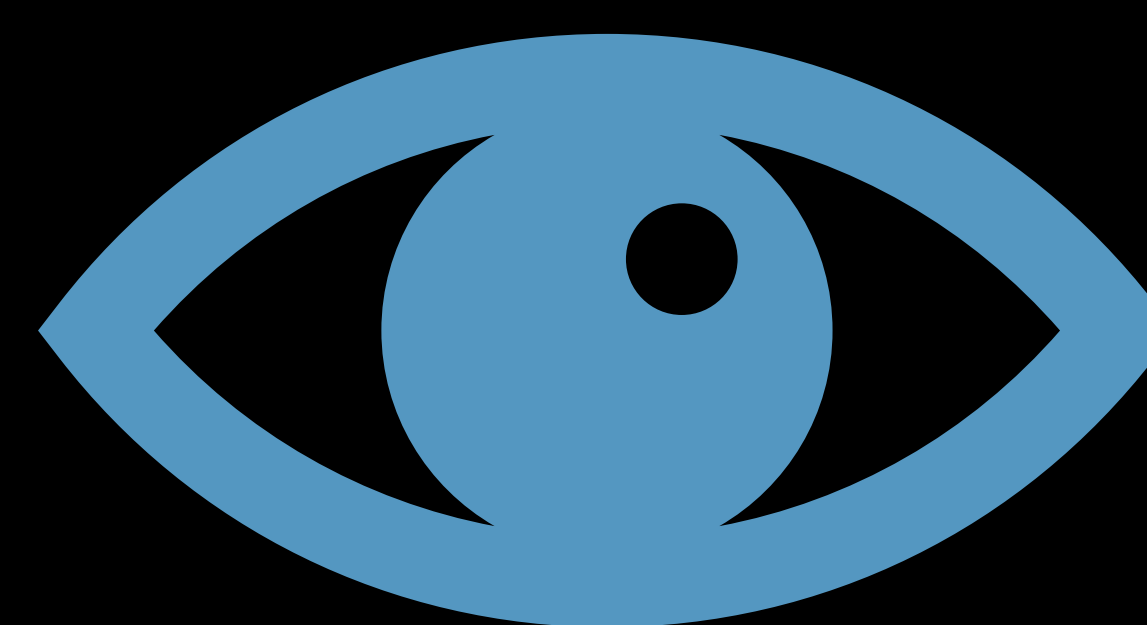
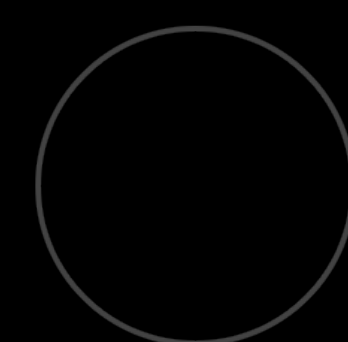
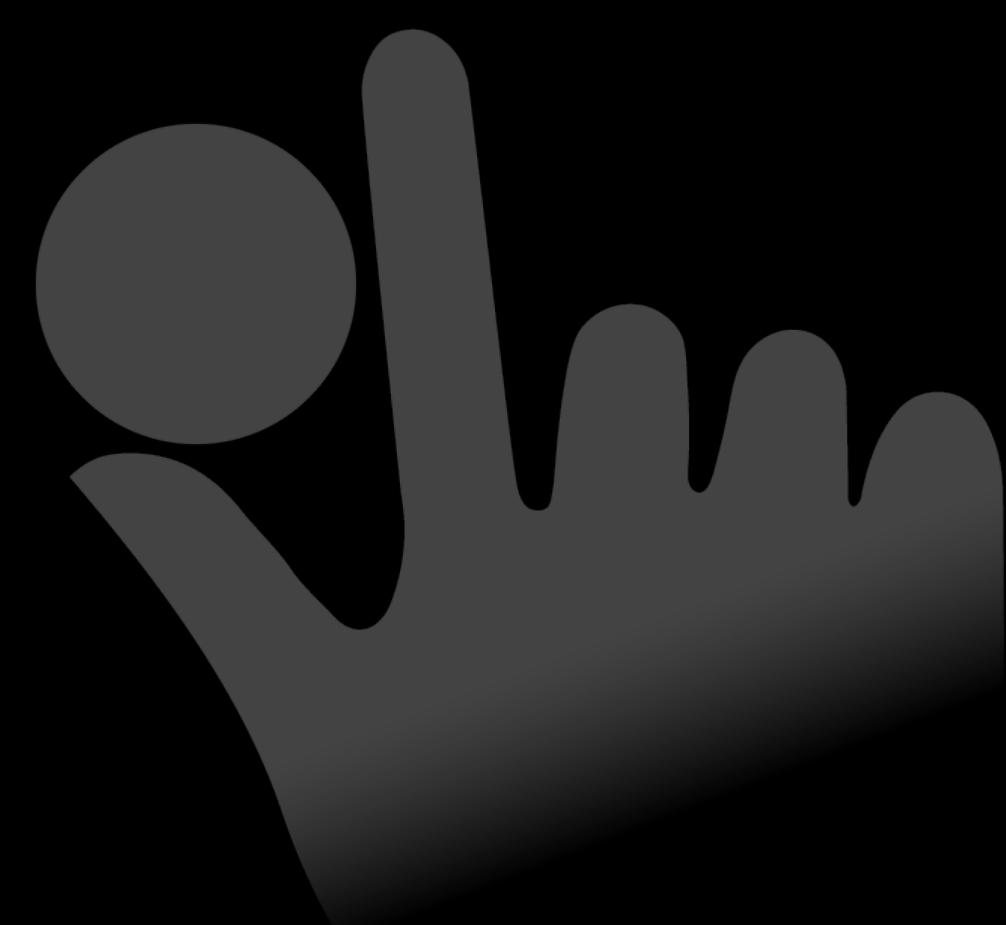
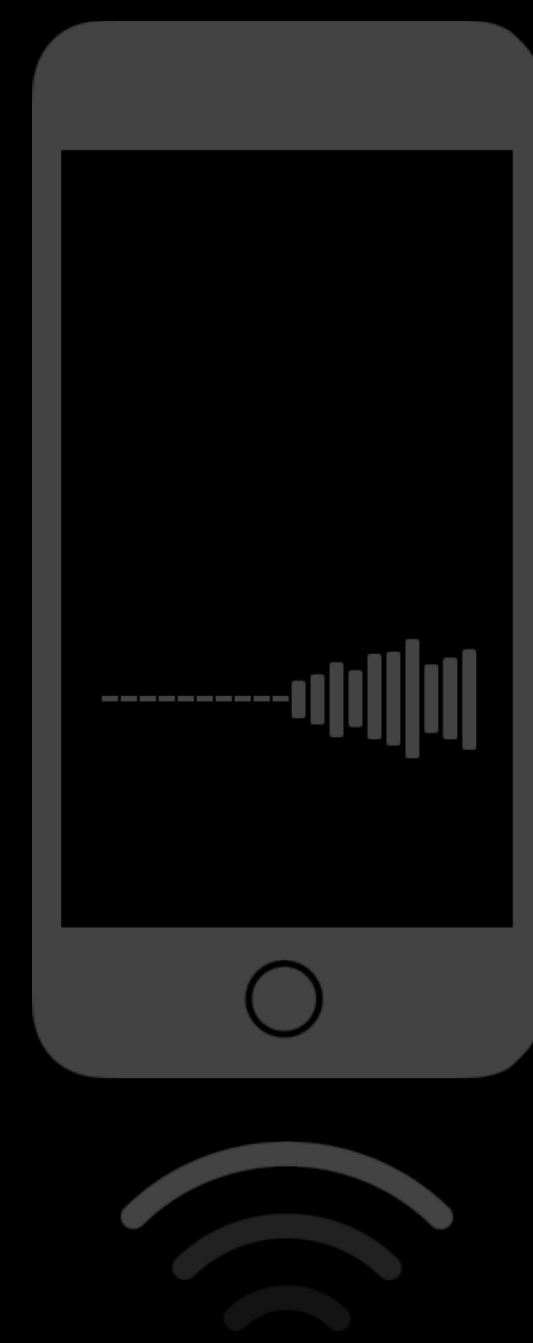
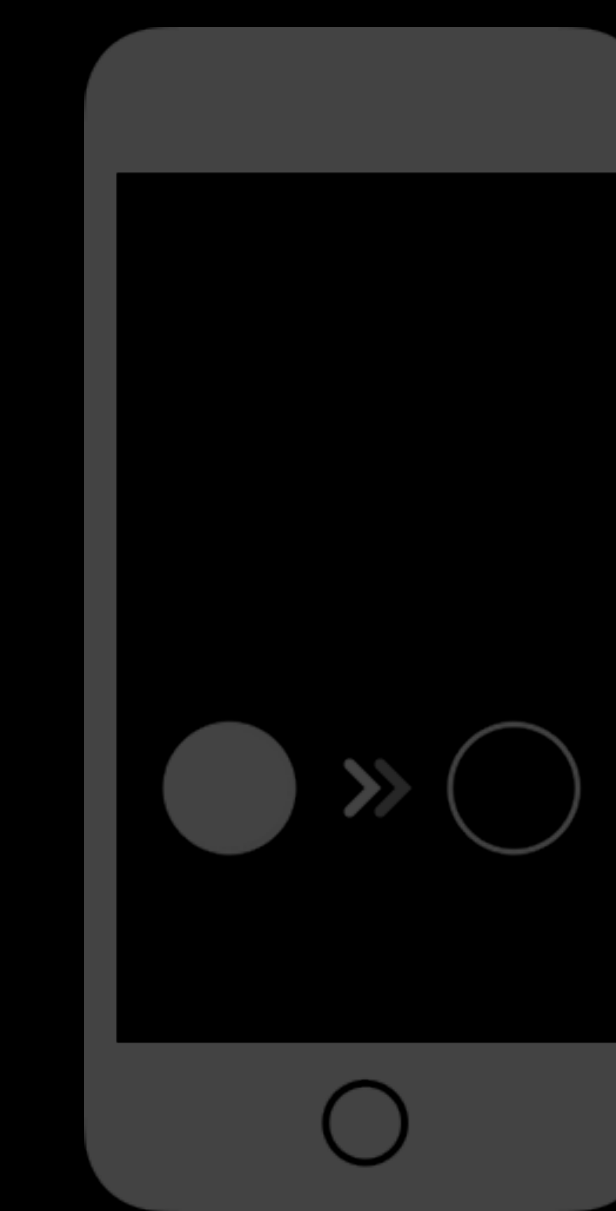
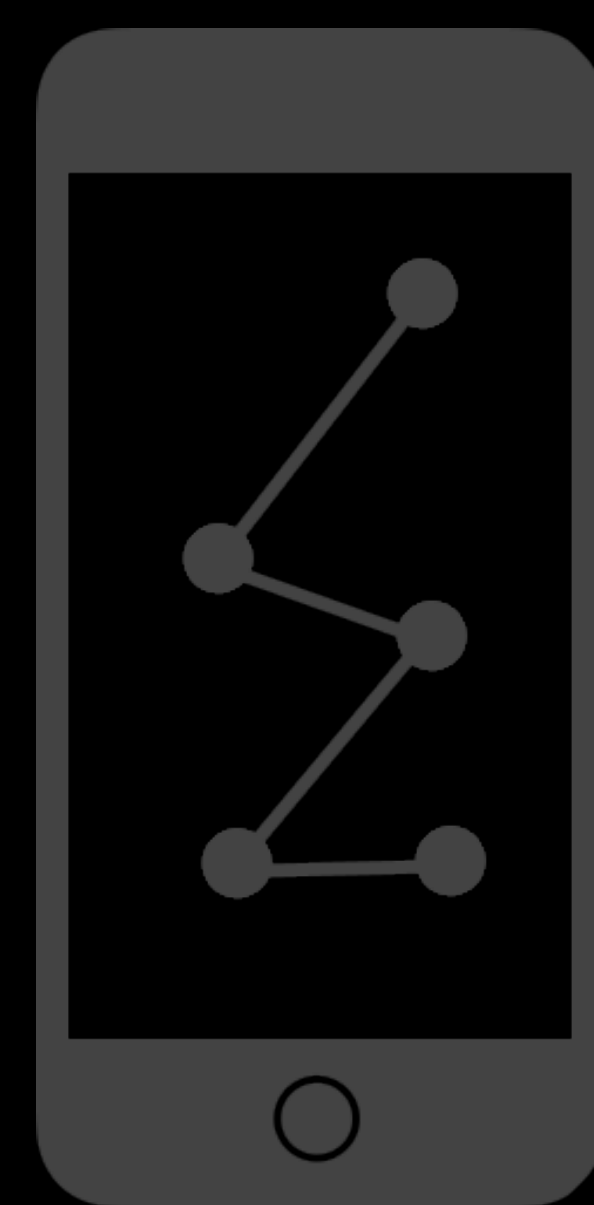
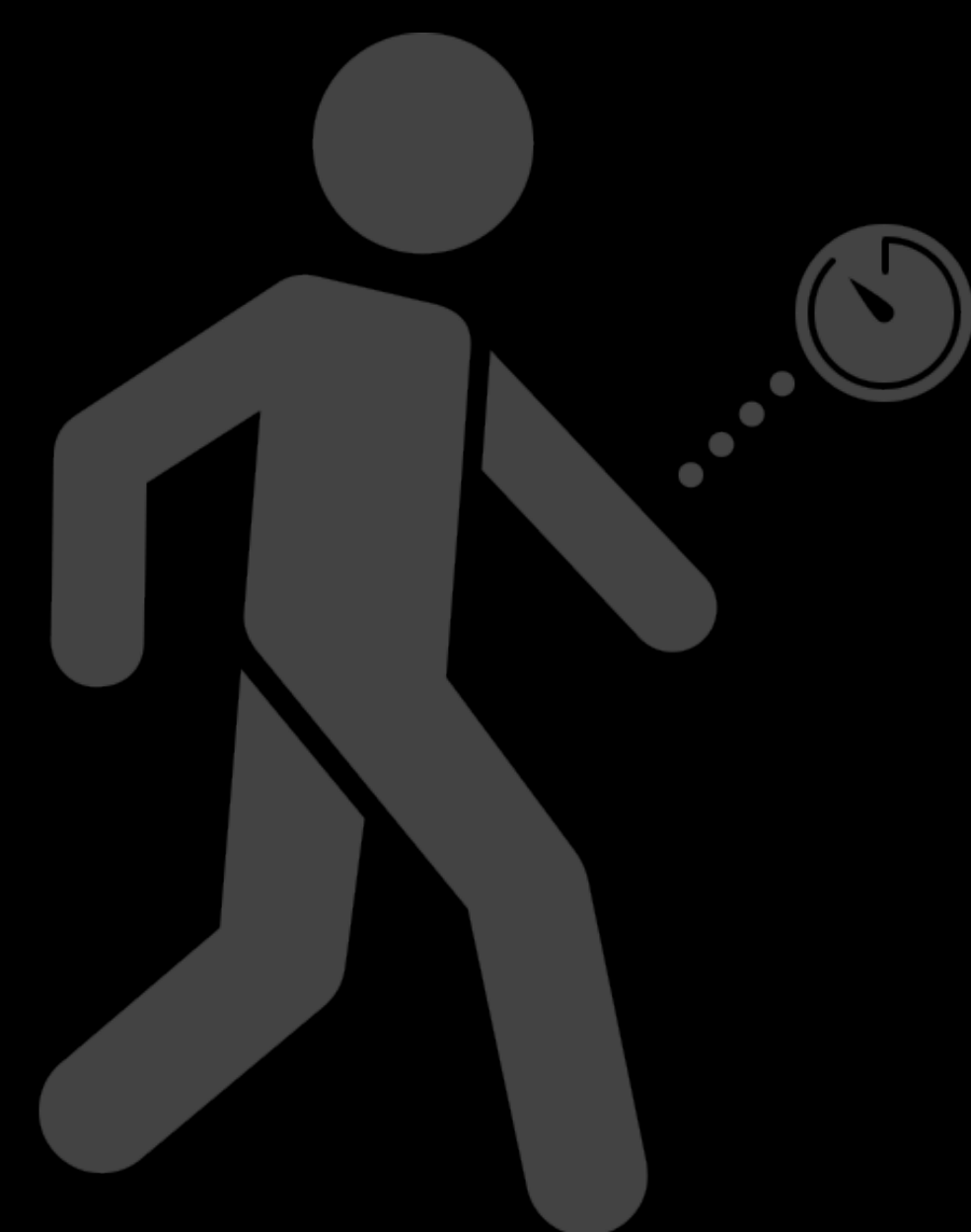
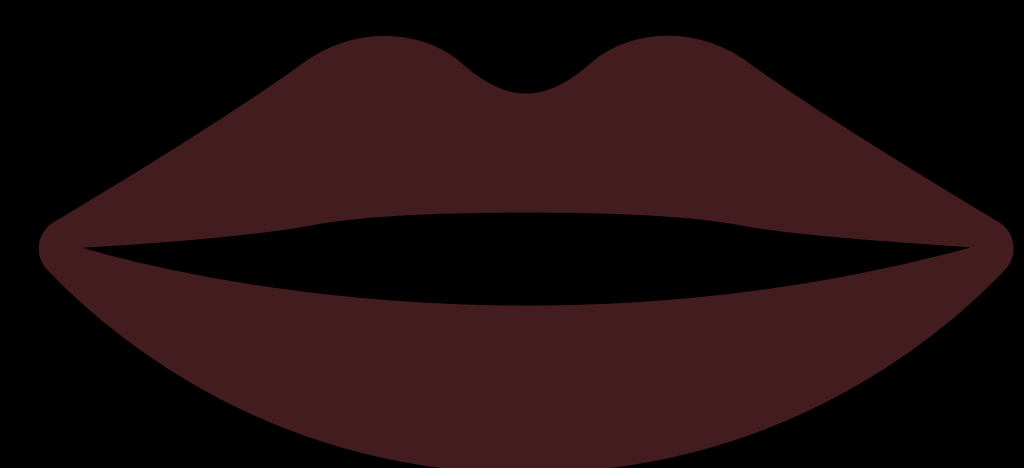
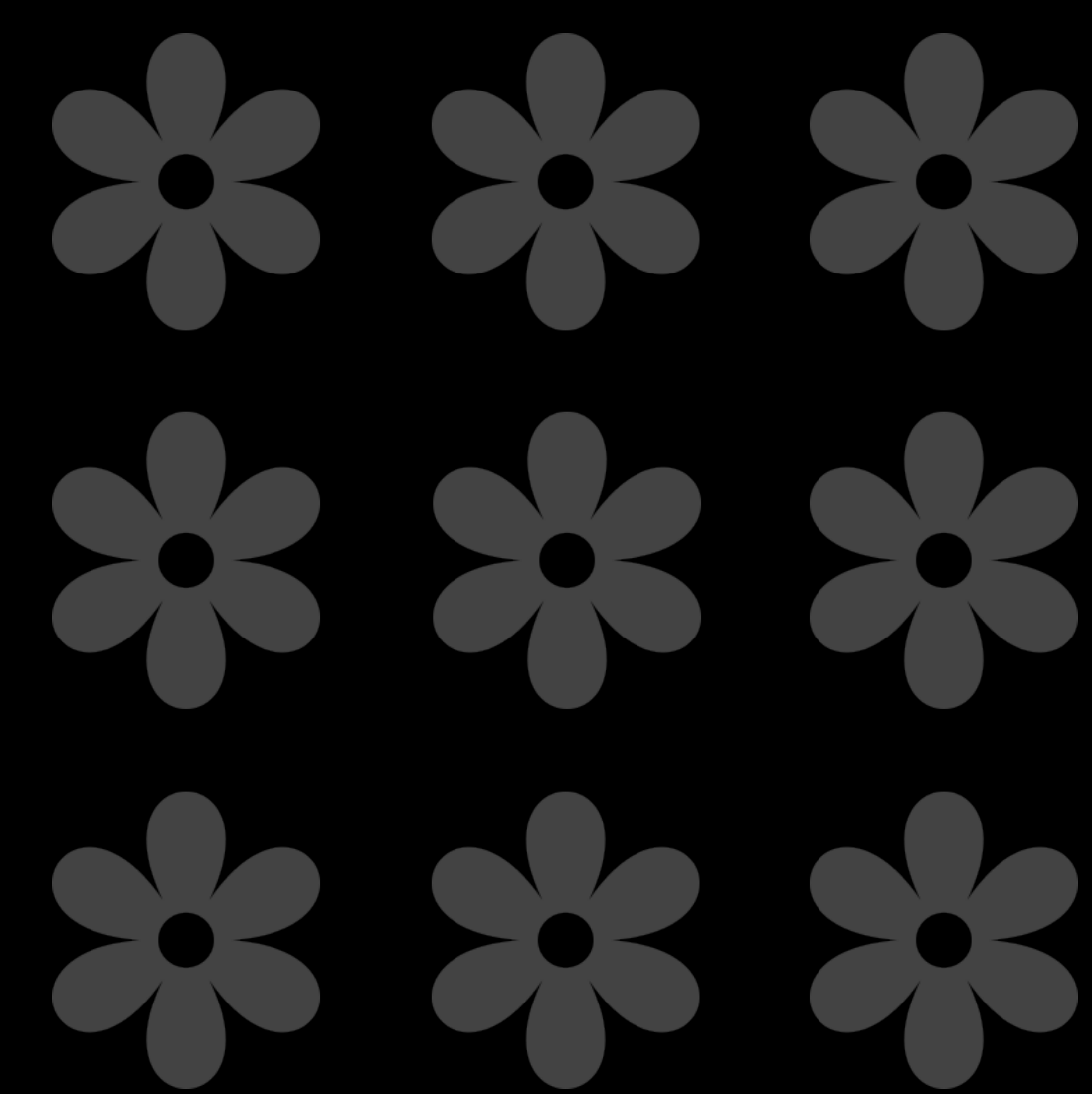
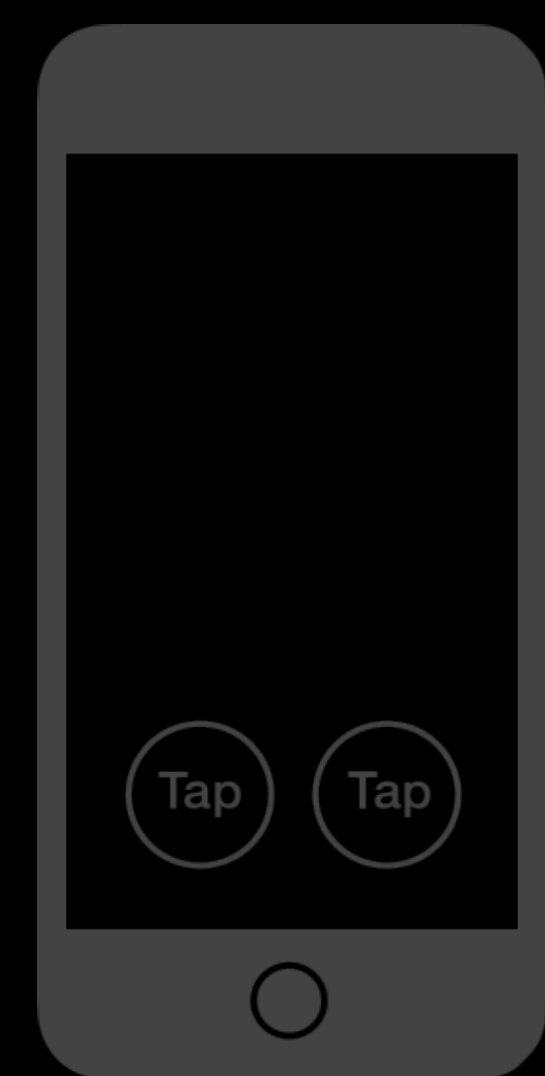
```
import ResearchKit
```

```
let step = ORKSpeechInNoiseStep(identifier: "speechInNoiseStep")
```

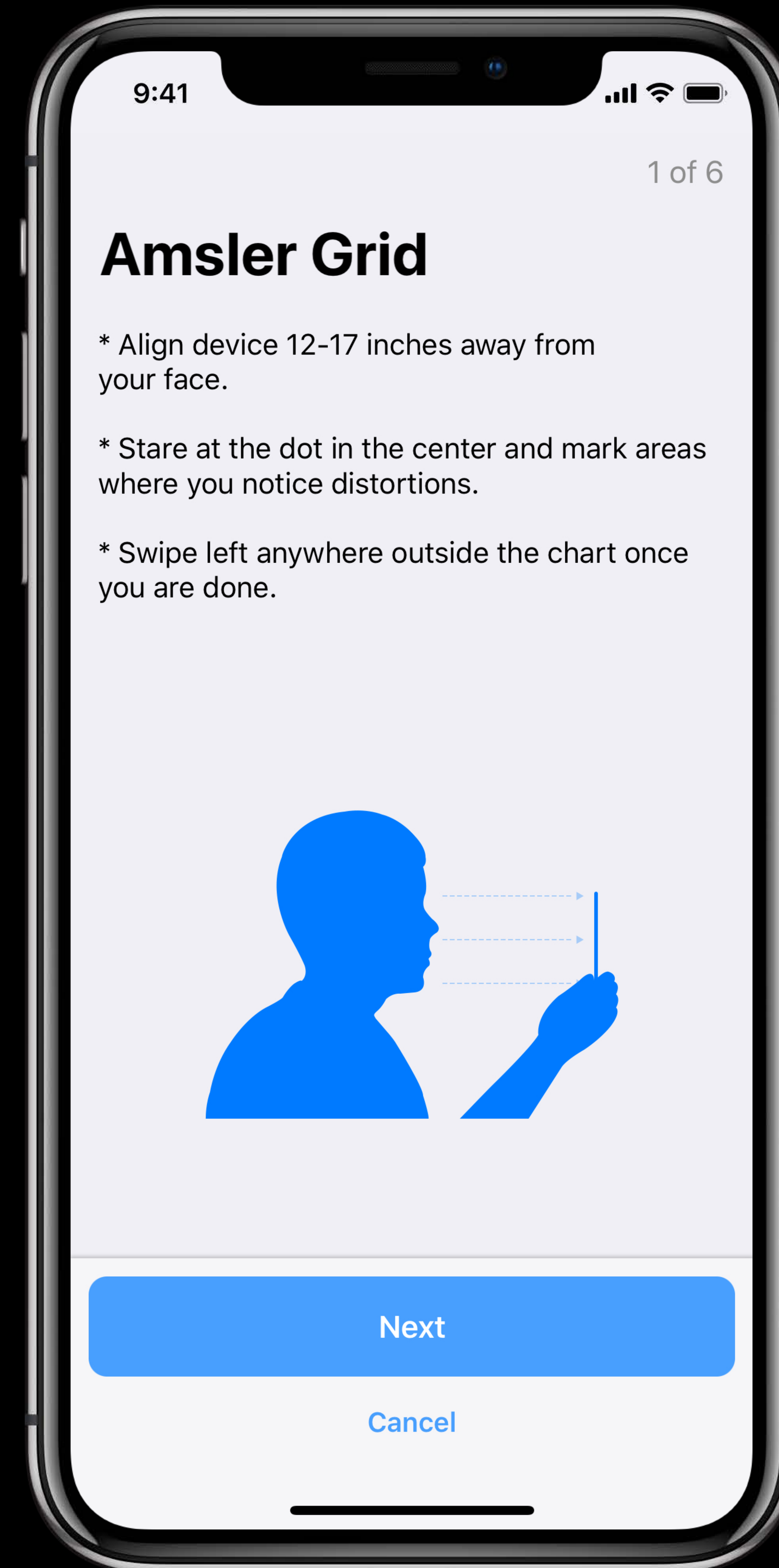
```
step.speechFileNameWithExtension = "Sentence17.wav"
```

```
step.gainAppliedToNoise = 0.73
```





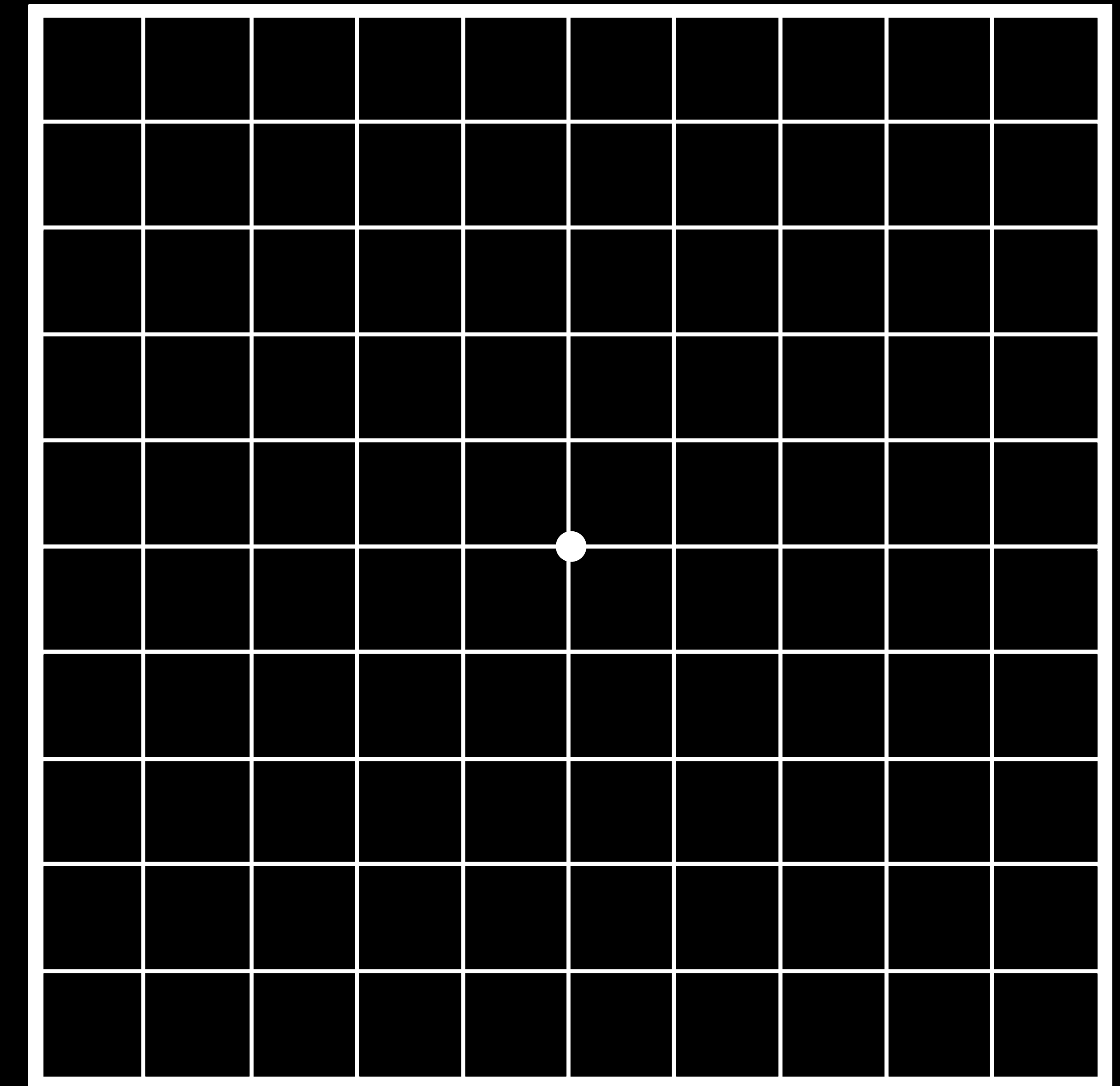
Amsler Grid



Amsler Grid

Vision Test

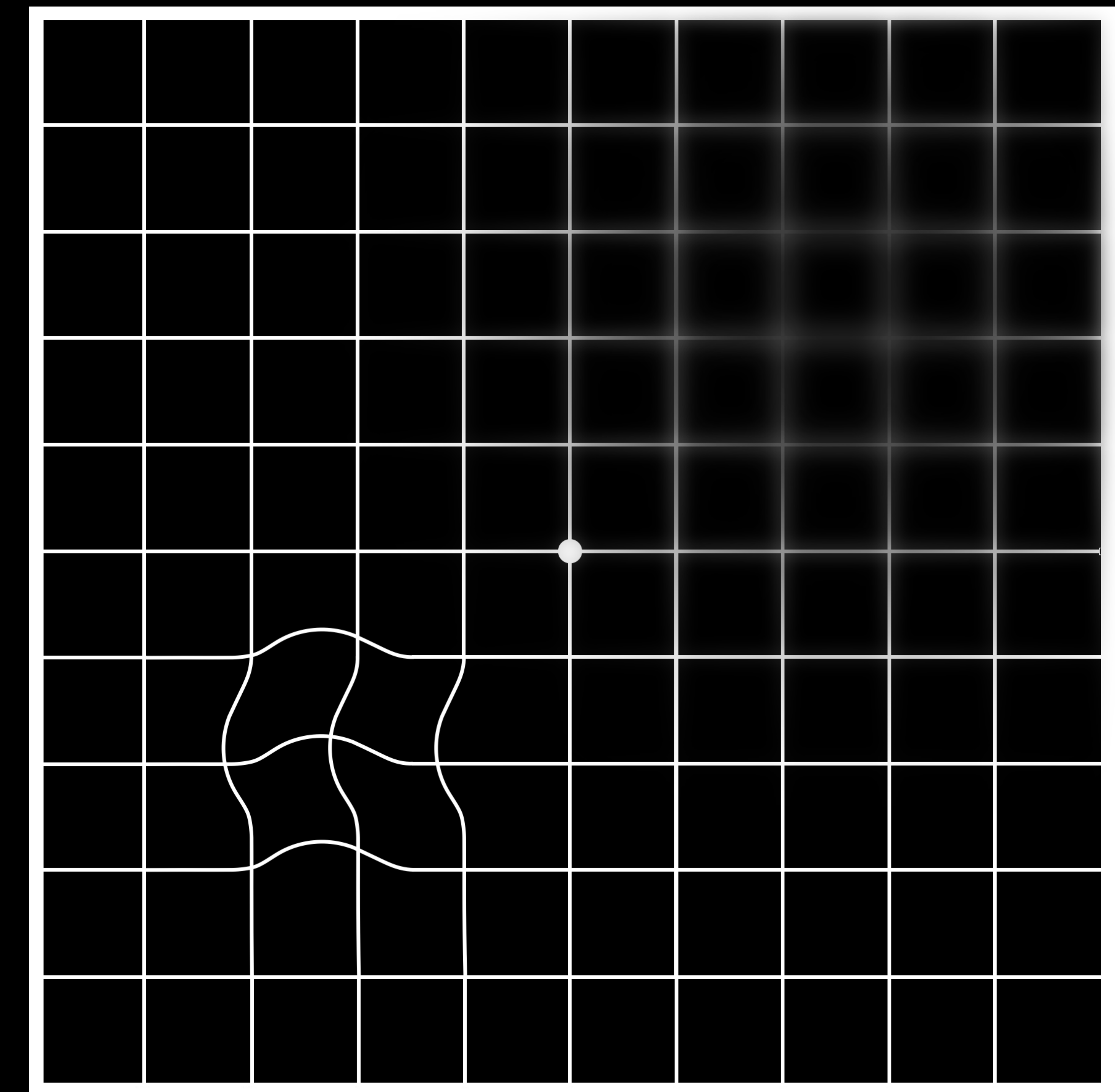
- Standard square grid
- Distortions visible in grid indicate problems



Amsler Grid

Vision Test

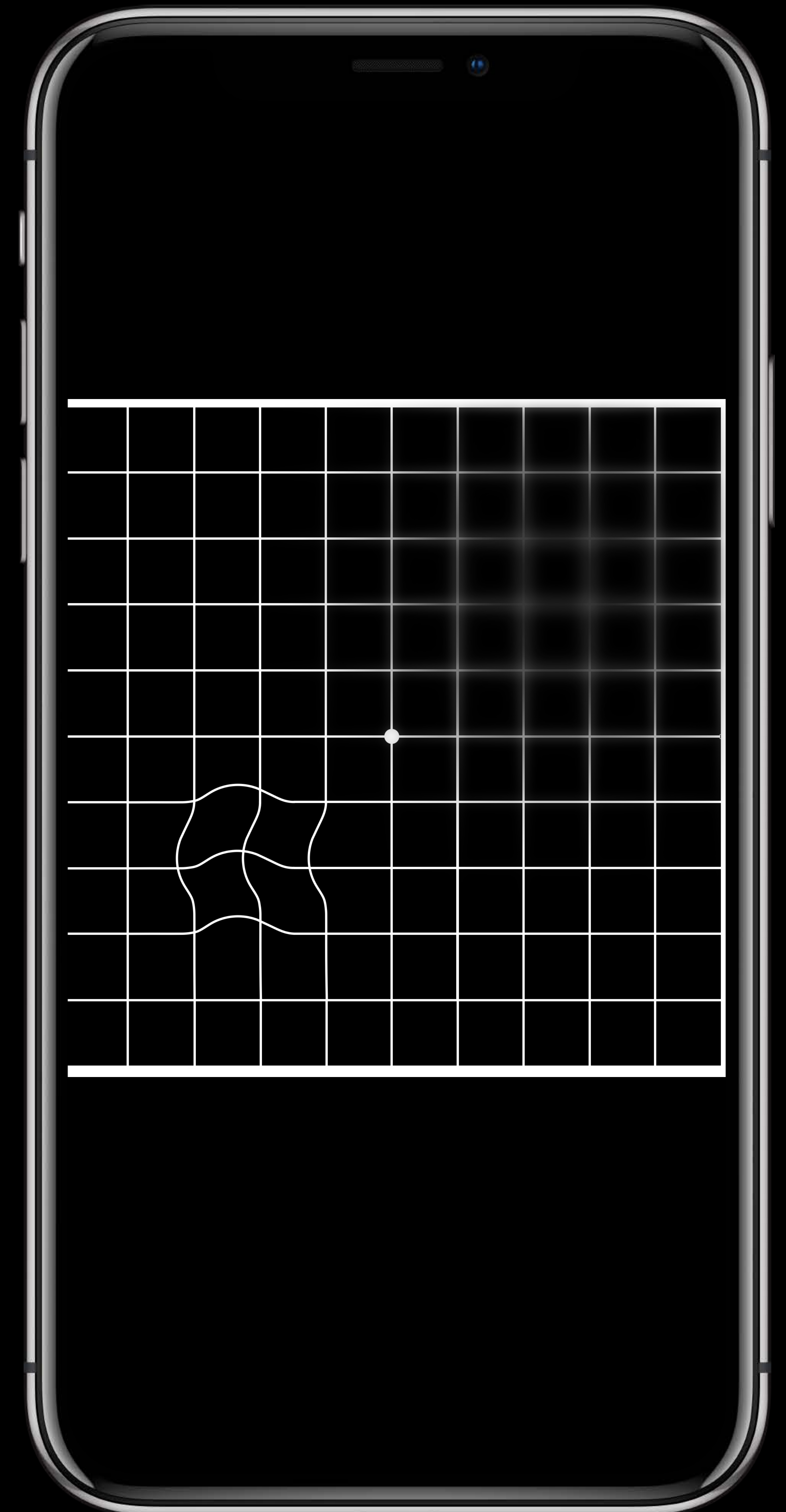
- Standard square grid
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Amsler Grid

Vision Test

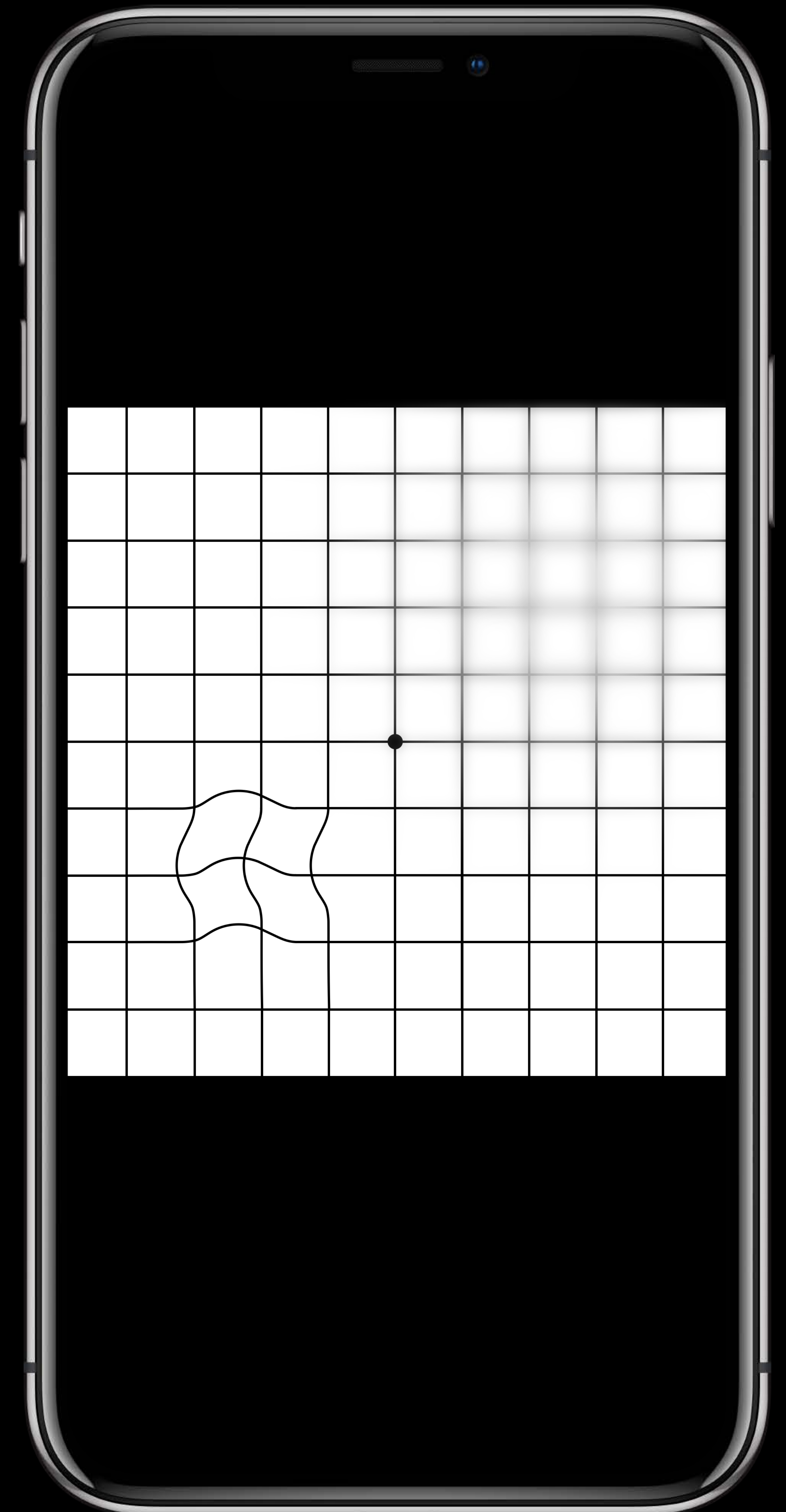
- Standard square grid
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Amsler Grid

Vision Test

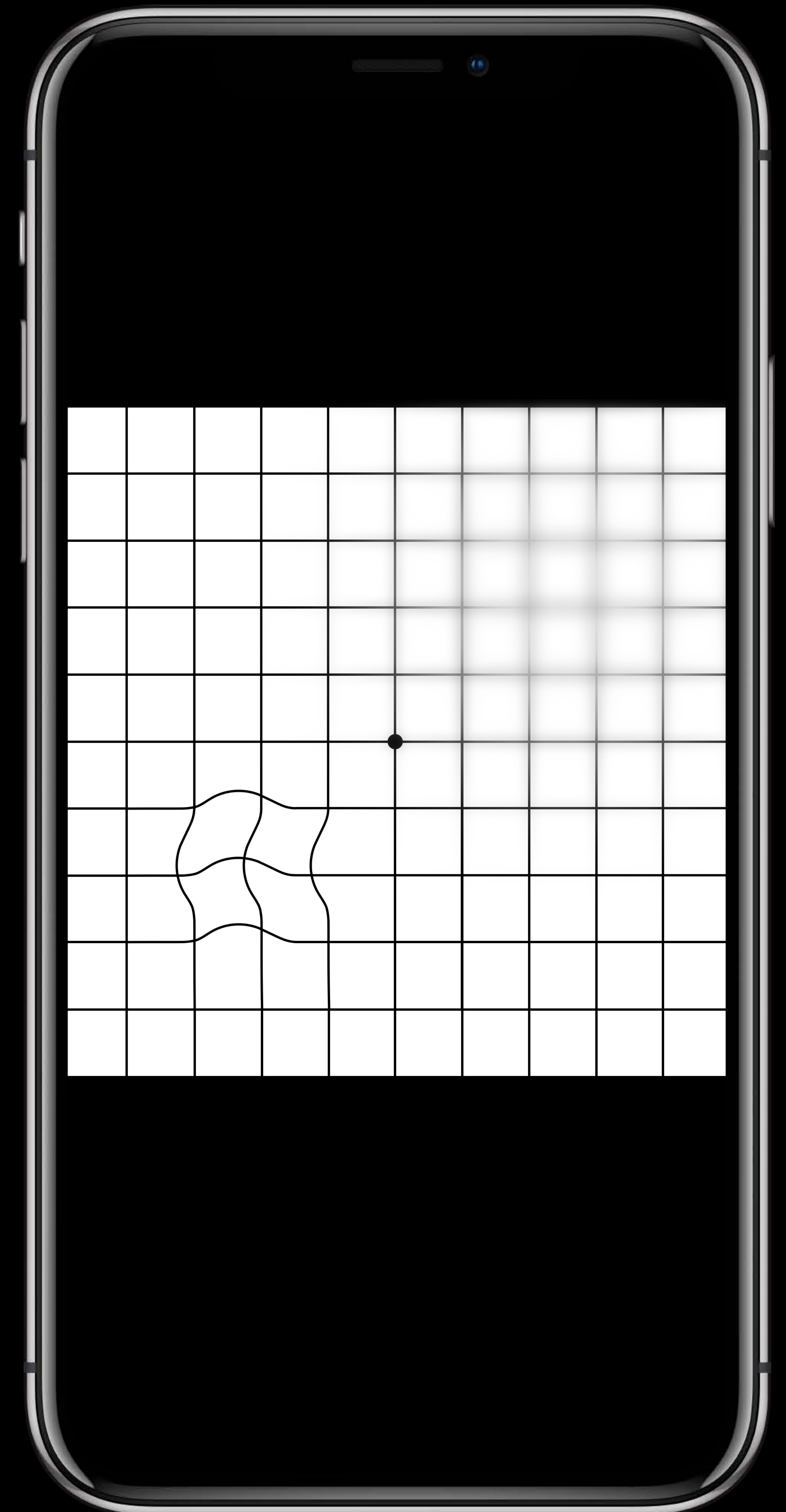
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Amsler Grid

Vision Test

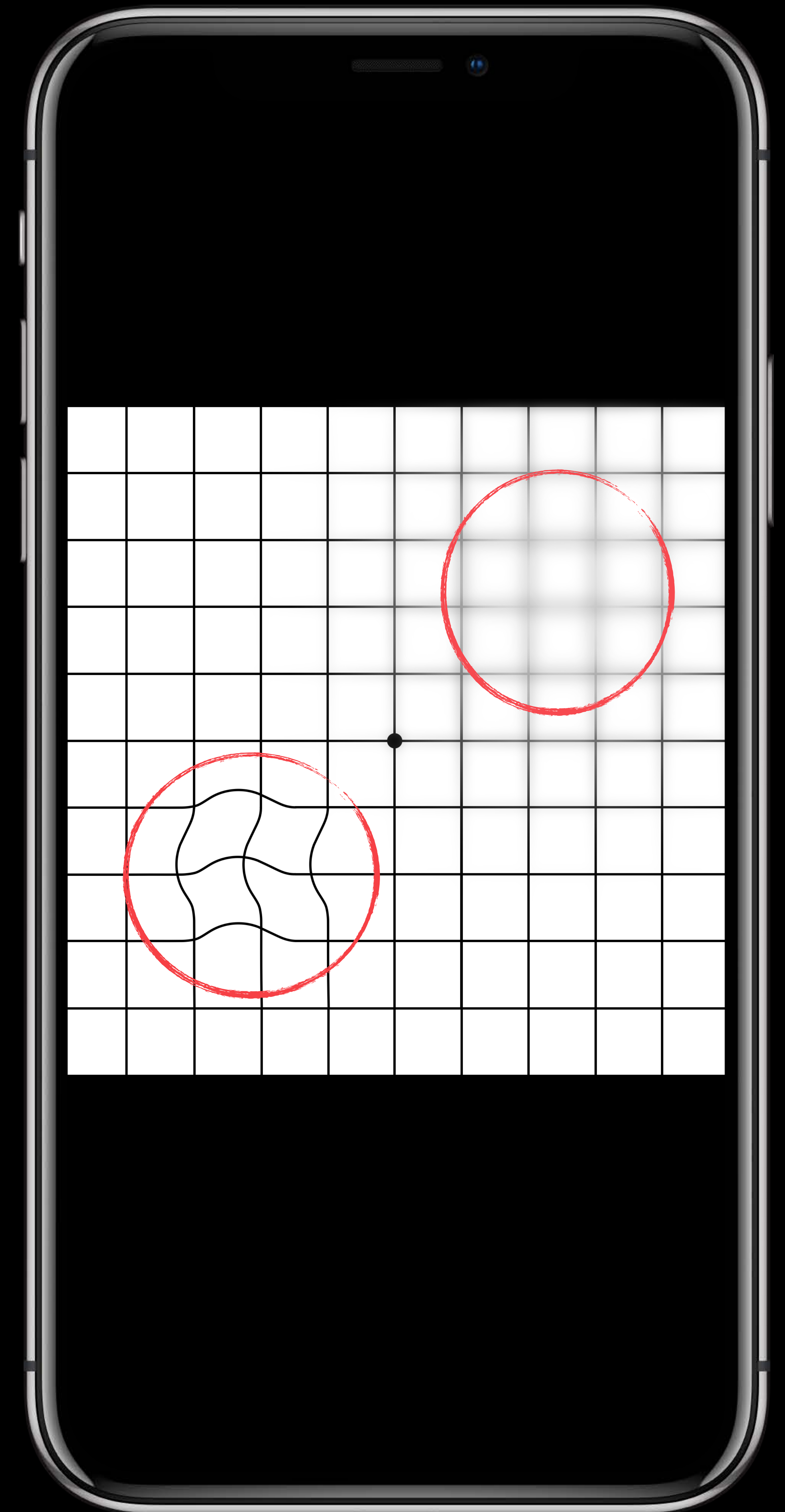
- Standard square grid
- Distortions visible in grid indicate problems

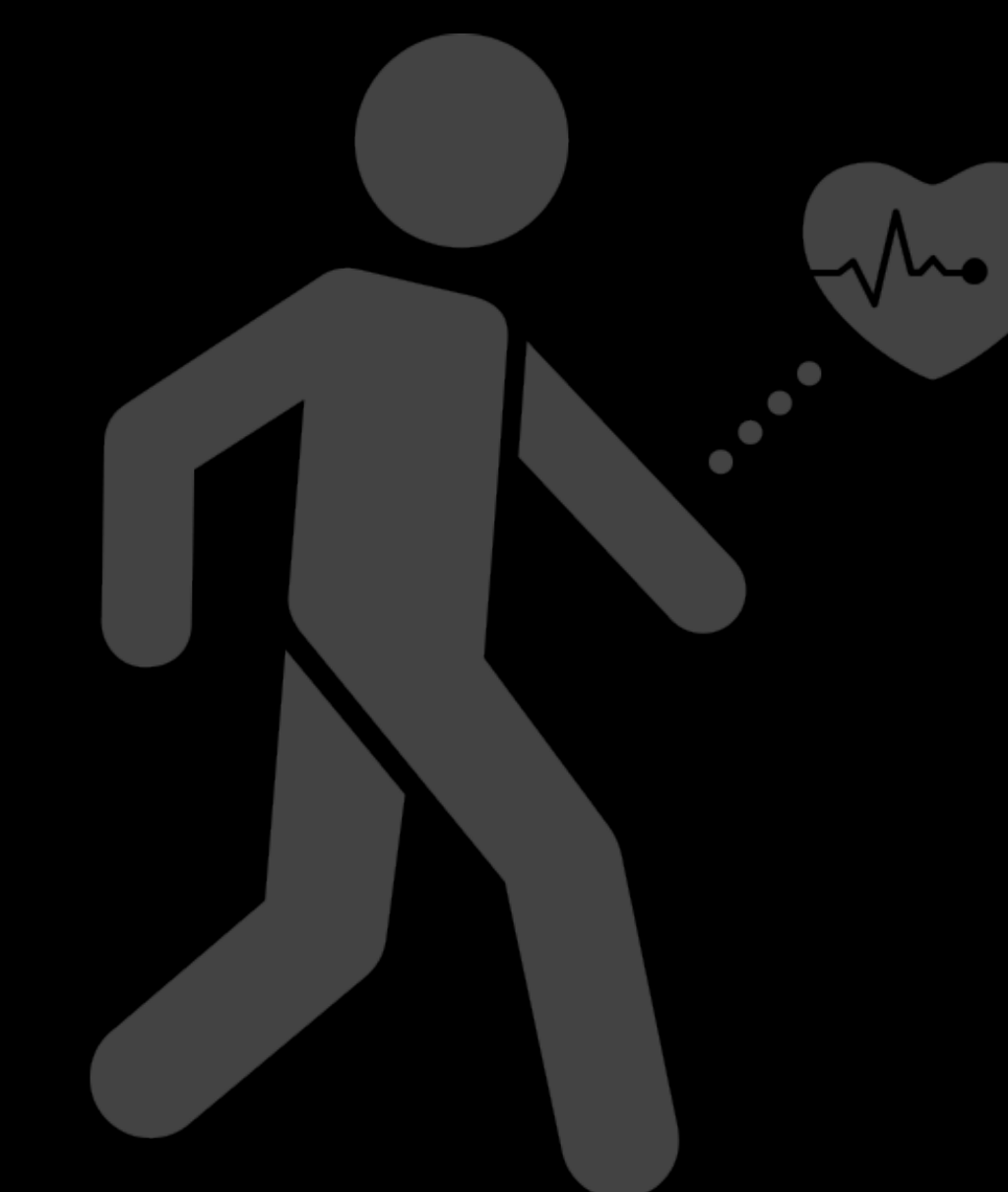
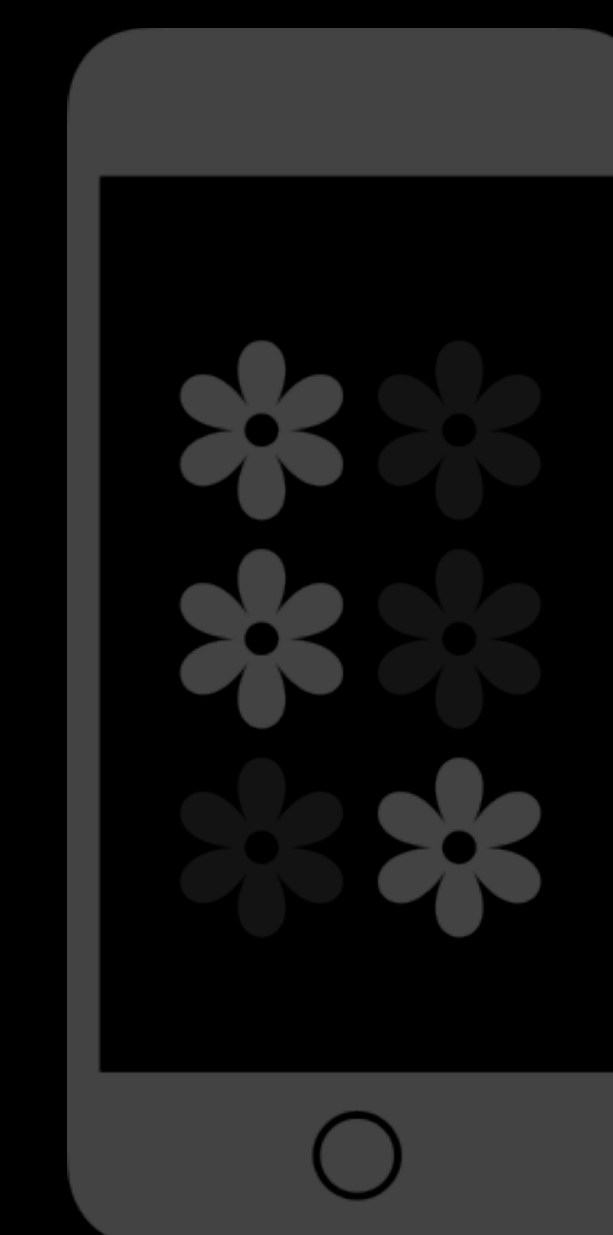
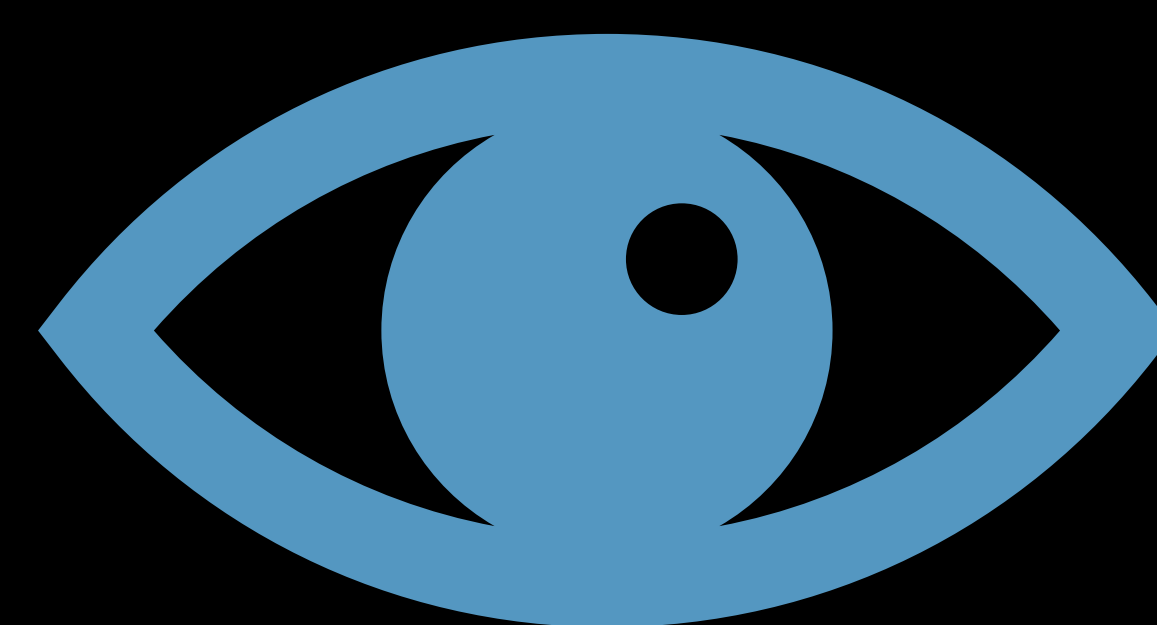
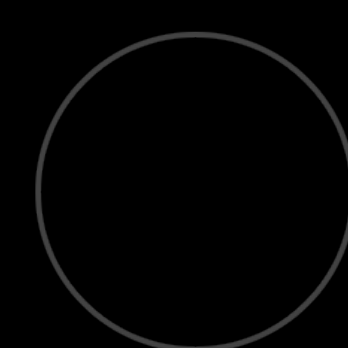
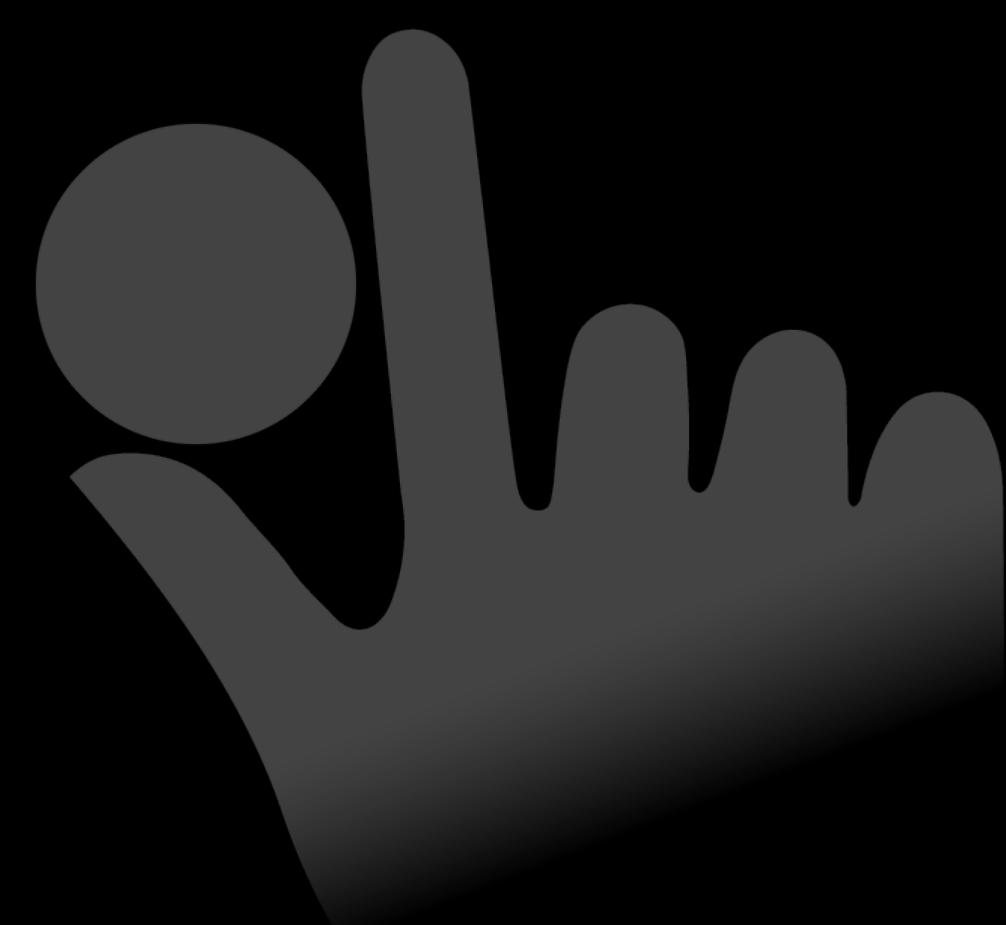
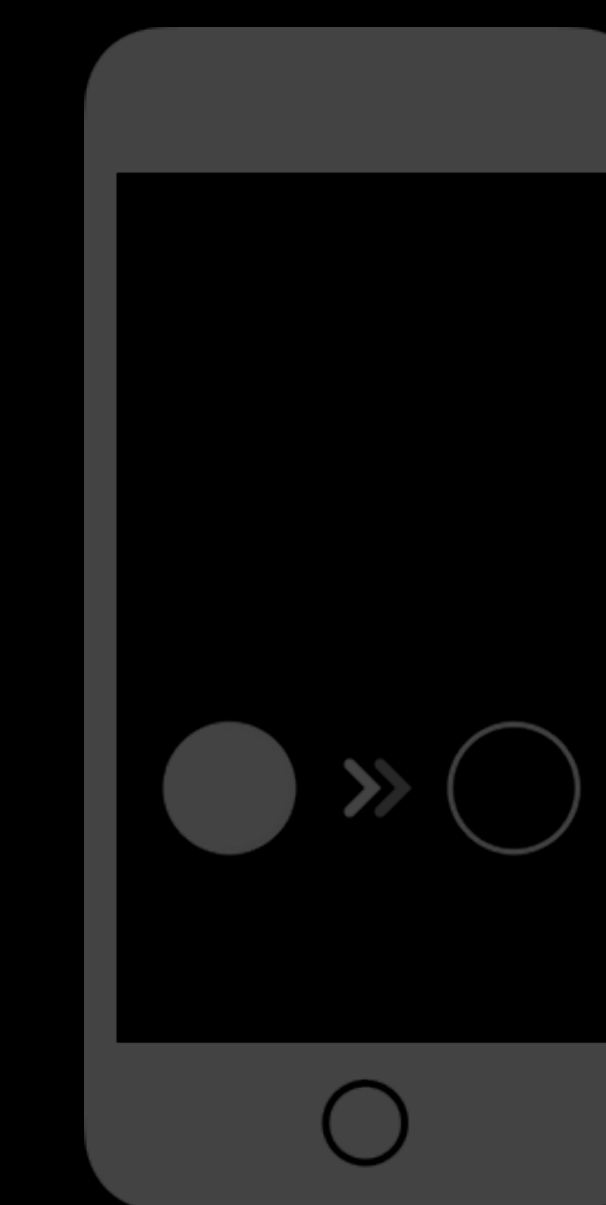
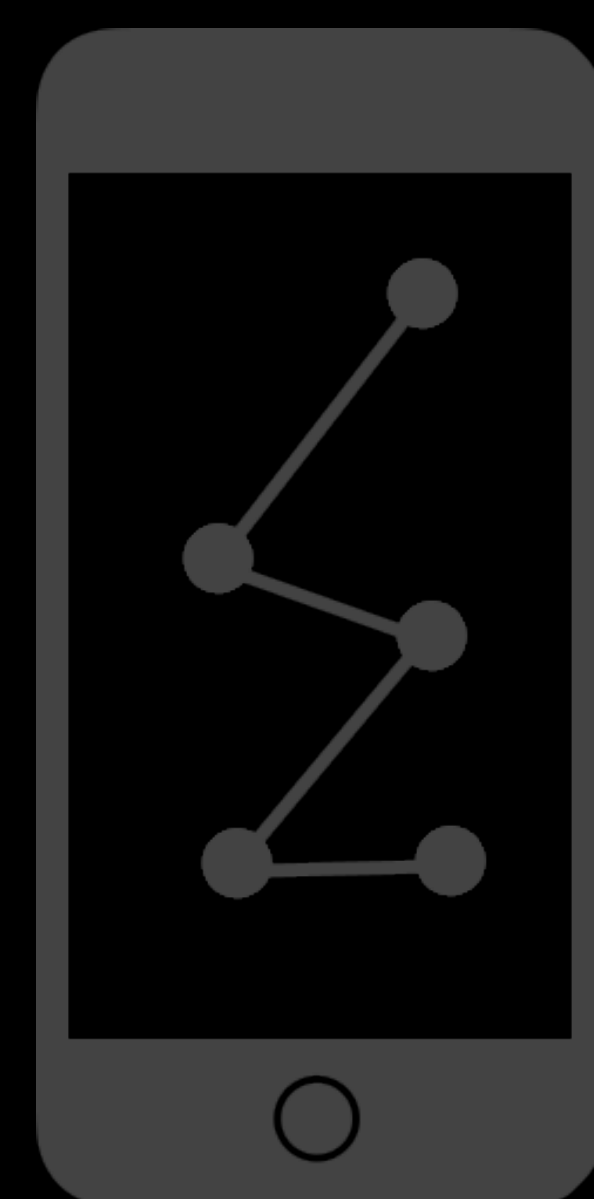
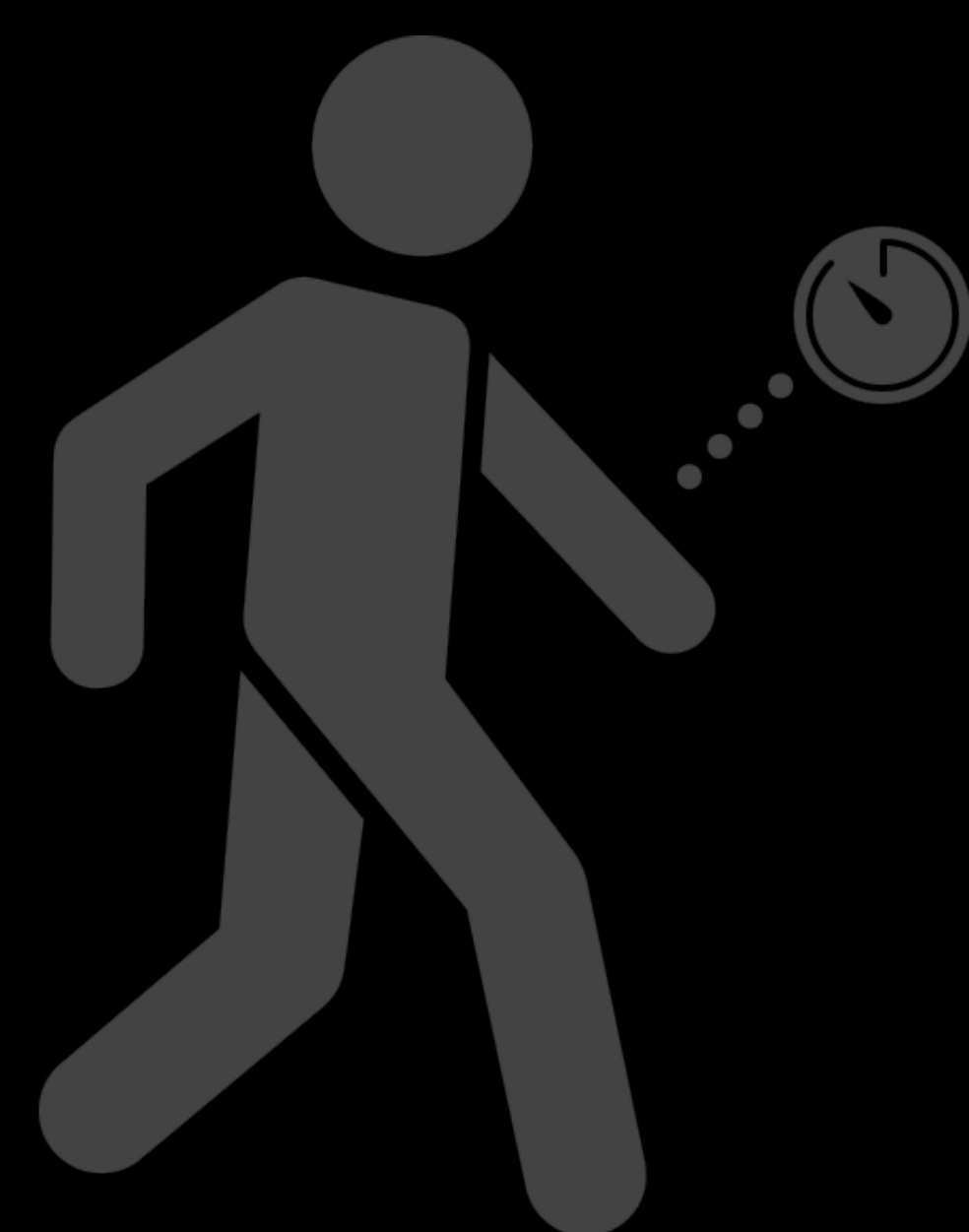
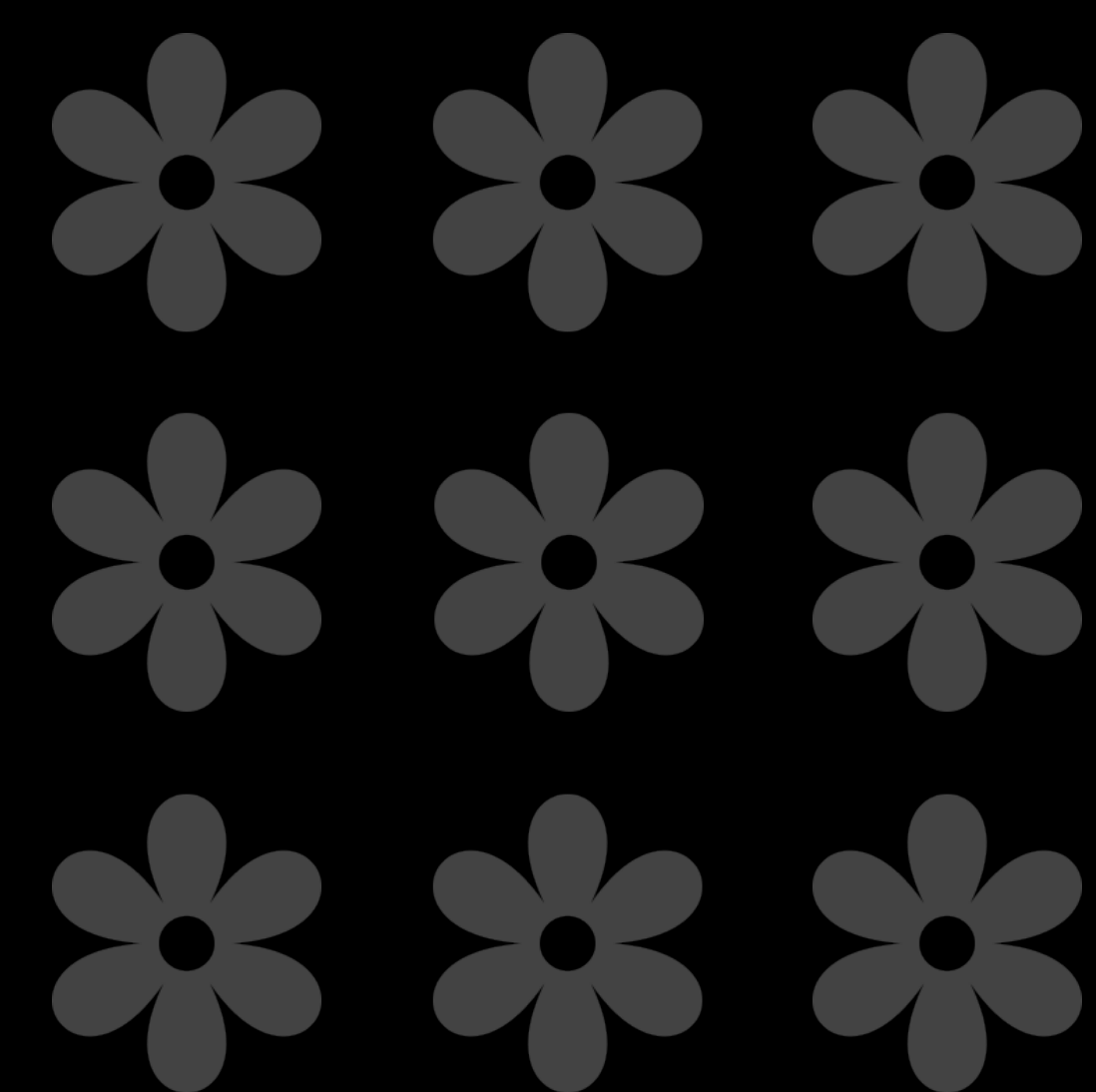
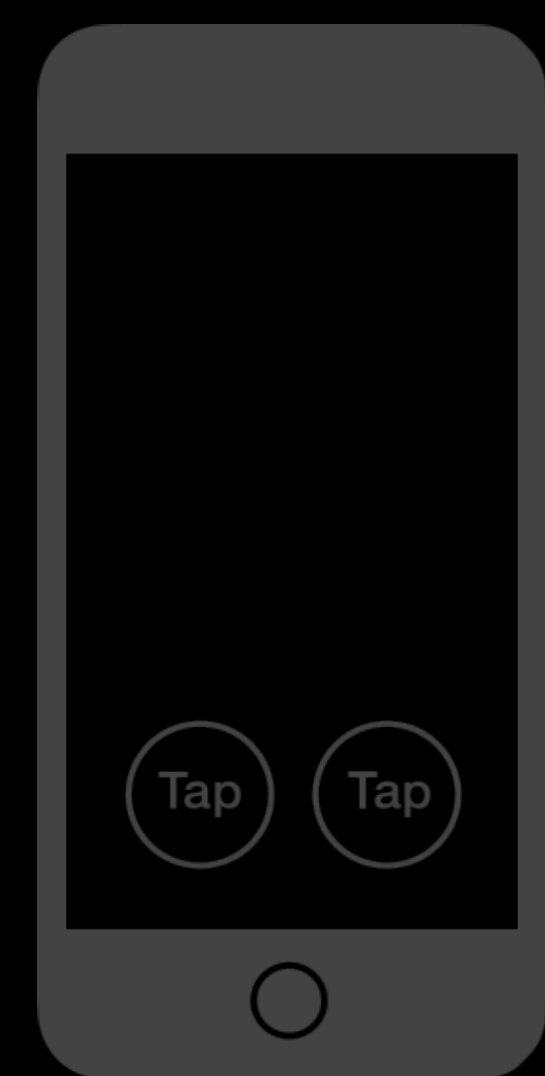


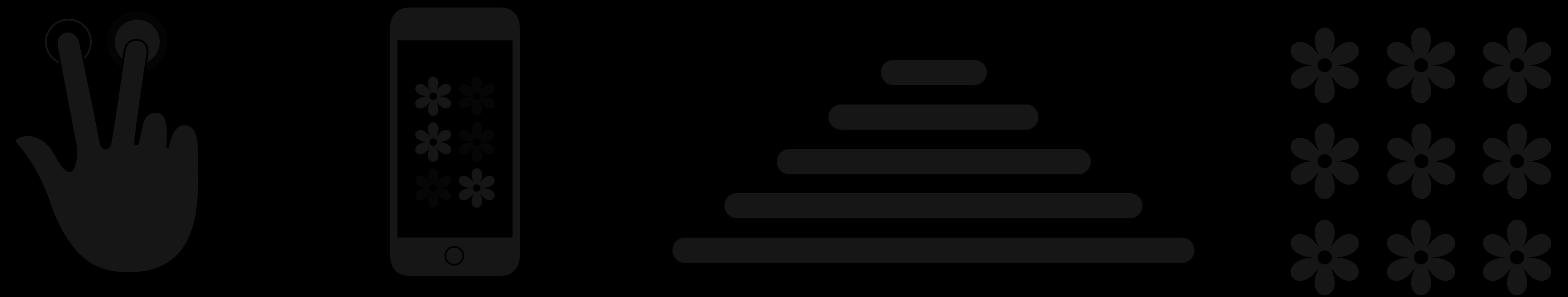
Amsler Grid

Vision Test

- Standard square grid
- Distortions visible in grid indicate problems







Active Tasks

Specified Duration of Time



Active Tasks

Specified Duration of Time



NEW

Movement Disorder API

Gabriel Blanco, Core Motion Engineer

API Features



API Features

All-day monitoring



API Features

All-day monitoring

Relevant to Parkinson's Disease



API Features

All-day monitoring

Relevant to Parkinson's Disease

Code signing entitlement



Parkinson's: Symptoms and Side-Effects

Tremor



Shaking, quivering

Dyskinesia



Fidgeting, swaying

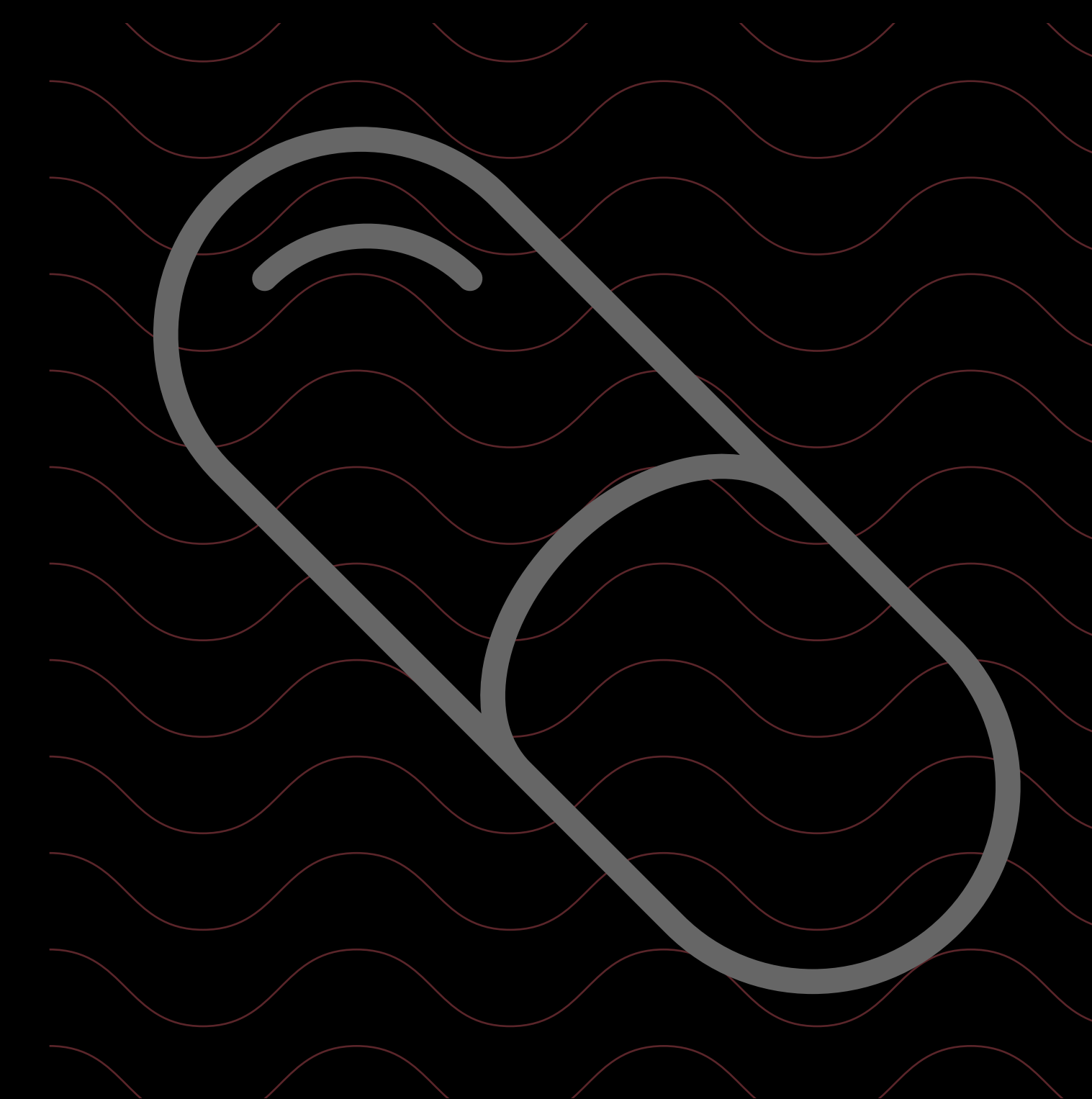
Parkinson's: Symptoms and Side-Effects

Tremor



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Fidgeting, swaying

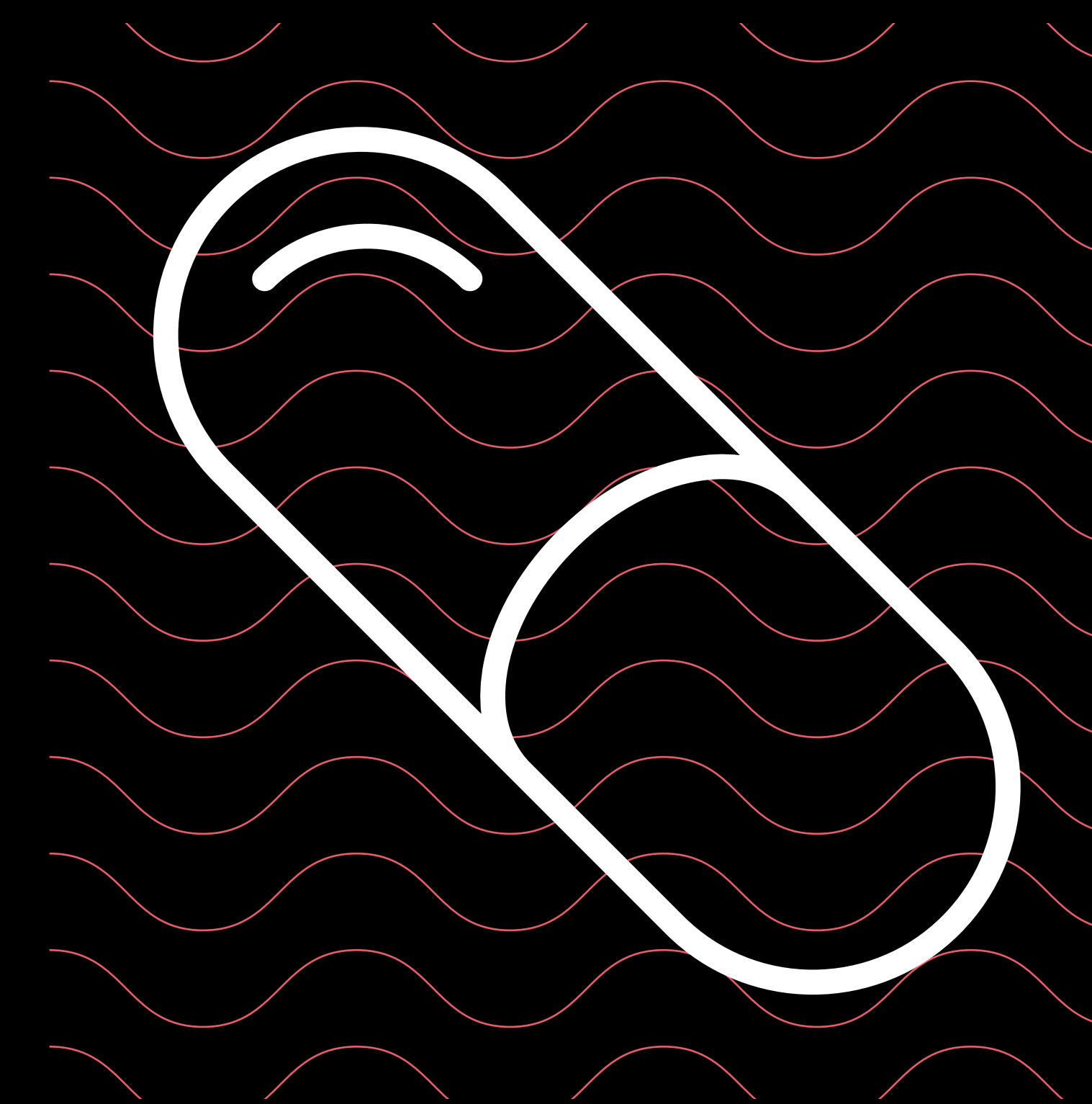
Parkinson's: Symptoms and Side-Effects

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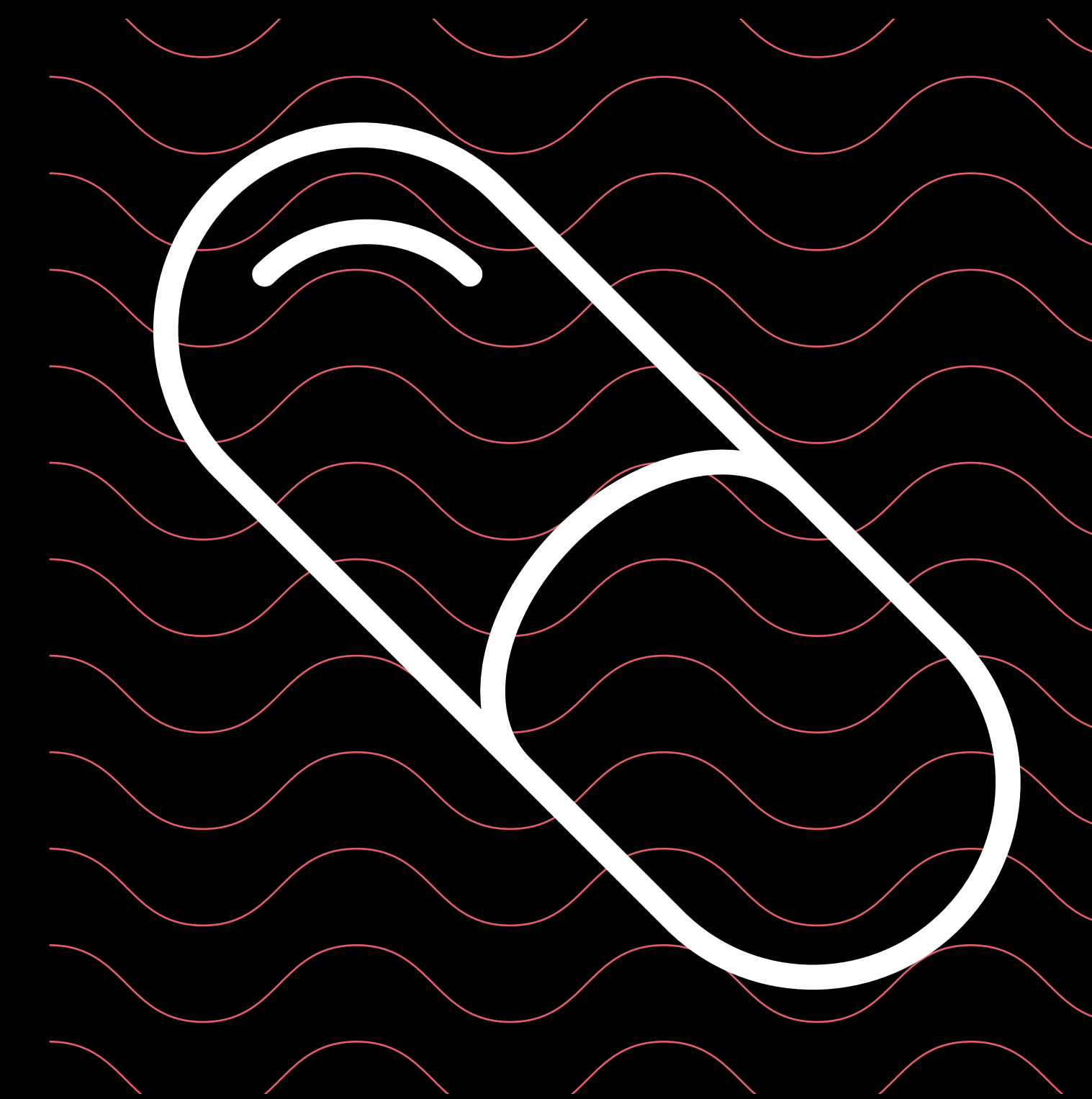
Parkinson's: Symptoms and Side-Effects

Tremor



Shaking, quivering

Dyskinesia



Fidgeting, swaying

Current Tools for Symptom Tracking



Current Tools for Symptom Tracking

In clinic



Current Tools for Symptom Tracking

In clinic

Diagnostic tests



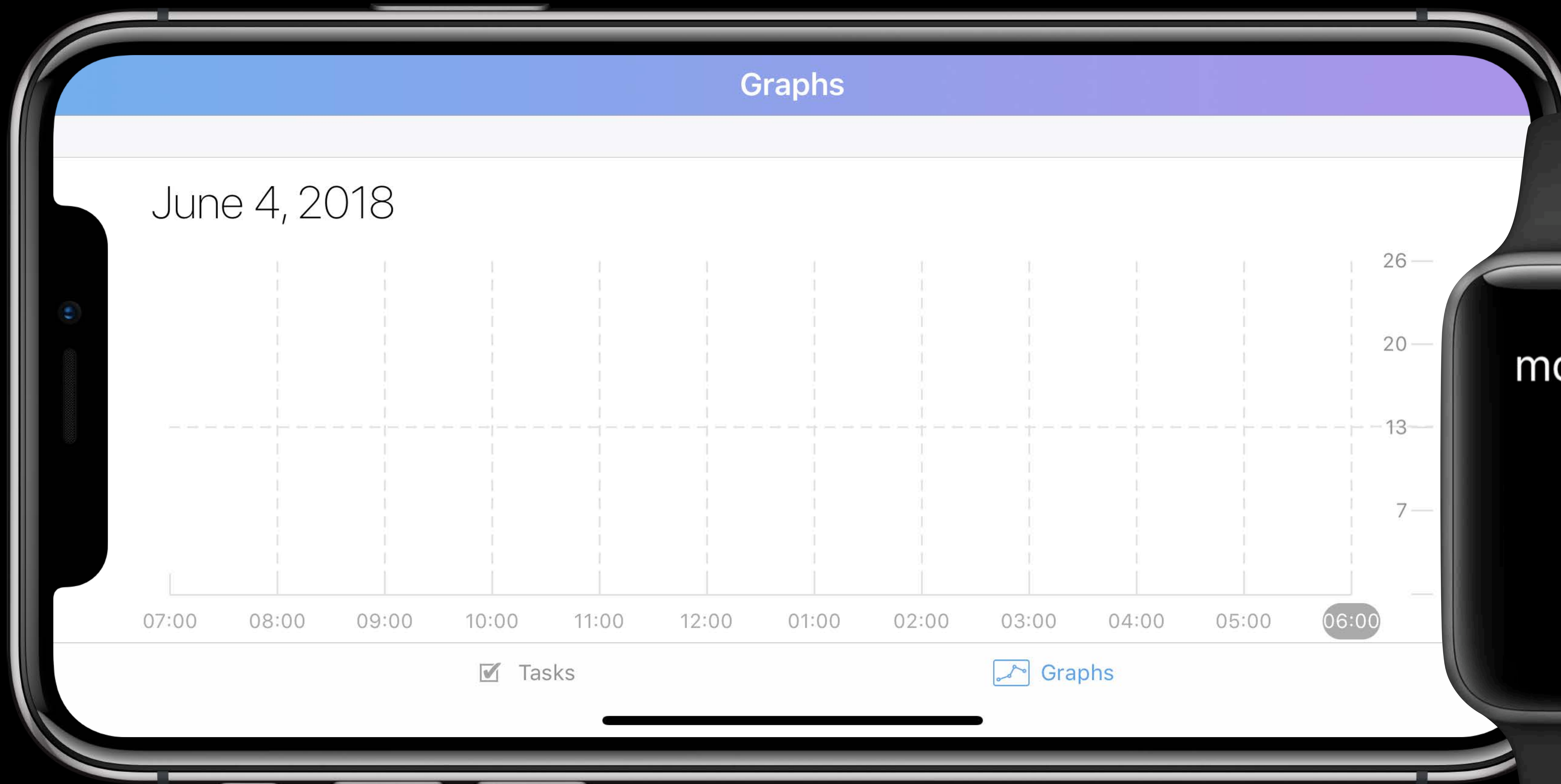
Current Tools for Symptom Tracking

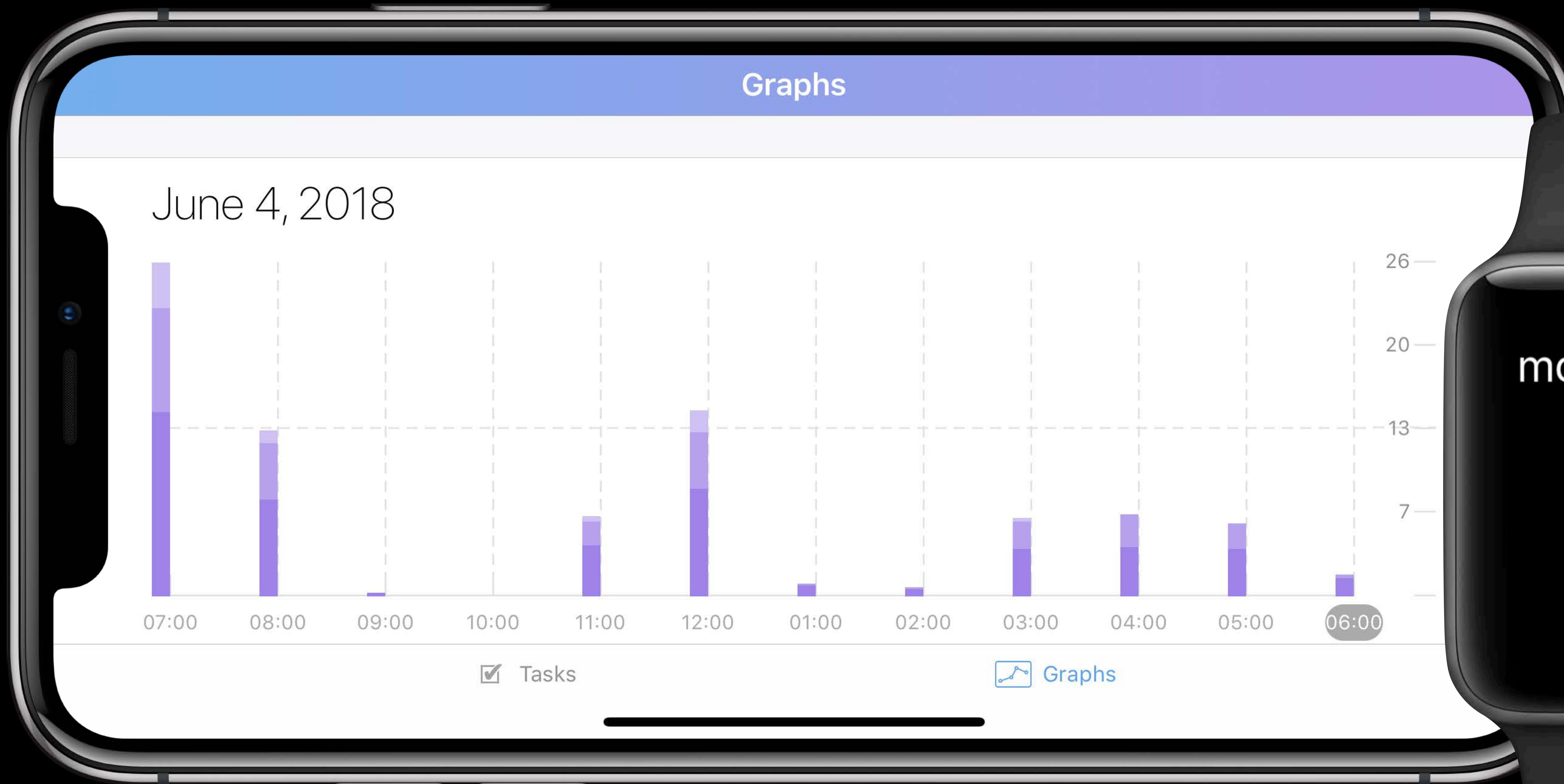
In clinic

Diagnostic tests

Patient diaries







 Tremor





■ Tremor ■ Dyskinesia



```
//Initialization
```

```
import CoreMotion.CMMovementDisorderManager
```

```
let status = CMMovementDisorderManager.authorizationStatus()
```

```
if CMMovementDisorderManager.isAvailable() {
```

```
    let manager = CMMovementDisorderManager()
```

```
}
```

```
//Initialization
import CoreMotion.CMMovementDisorderManager
let maxRecordingDuration = 7 * 24 * 3600 // Seven Days
let status = CMMovementDisorderManager.authorizationStatus()

if CMMovementDisorderManager.isAvailable() {
    let manager = CMMovementDisorderManager()
    manager.monitorKinesias(forDuration: maxRecordingDuration)
}
```

```
//Initialization
```

```
import CoreMotion.CMMovementDisorderManager
```

```
let maxRecordingDuration = 7 * 24 * 3600 // Seven Days
```

```
let status = CMMovementDisorderManager.authorizationStatus()
```

```
if CMMovementDisorderManager.isAvailable() {
```

```
    let manager = CMMovementDisorderManager()
```

```
    manager.monitorKinesias(forDuration: maxRecordingDuration)
```

```
}
```



```
//Query
let now = Date()
manager.queryTremor(from: self.lastQueriedDate, to: now) { (tremor, error) in
    if let error = error {
        print("Could not query data")
        return
    }
    self.writeRecordsToFile( ) tremor
}

manager.queryDyskineticSymptom(from: self.lastQueriedDate, to: now) { (dyskinesia, error) in
    if let error = error {
        print("Could not query data")
        return
    }
    self.writeRecordsToFile( ) dyskinesia
}
```

```
//Query
```

```
let now = Date()
```

```
manager.queryTremor(from: self.lastQueriedDate, to: now) { (tremor, error) in
```

```
    if let error = error {
```

```
        print("Could not query data")
```

```
        return
```

```
    }
```

```
    self.writeRecordsToFile( ) tremor
```

```
}
```

```
manager.queryDyskineticSymptom(from: self.lastQueriedDate, to: now) { (dyskinesia, error) in
```

```
    if let error = error {
```

```
        print("Could not query data")
```

```
        return
```

```
    }
```

```
    self.writeRecordsToFile( ) dyskinesia
```

```
}
```

```
//Query
```

```
let now = Date()
```

```
manager.queryTremor(from: self.lastQueriedDate, to: now) { (tremor, error) in
```

```
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```

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```

```
        return
```

```
    }
```

```
    self.writeRecordsToFile( ) tremor
```

```
}
```

```
manager.queryDyskineticSymptom(from: self.lastQueriedDate, to: now) { (dyskinesia, error) in
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    if let error = error {
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```
        print("Could not query data")
```

```
        return
```

```
    }
```

```
    self.writeRecordsToFile( ) dyskinesia
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```
}
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manager.queryDyskineticSymptom(from: self.lastQueriedDate, to: now) { (dyskinesia, error) in
    if let error = error {
        print("Could not query data")
        return
    }
    self.writeRecordsToFile( ) dyskinesia
}
```

tremor

dyskinesia

CMTremorResult

percent**Unknown**: Float

percent**None**: Float

percent**Slight**: Float

percent**Mild**: Float

percent**Moderate**: Float

percent**Strong**: Float

CMDyskineticSymptomResult

percent**Unlikely**: Float

percent**Likely**: Float

CMTremorResult

percent**Unknown**: Float

percent**None**: Float

percent**Slight**: Float

percent**Mild**: Float

percent**Moderate**: Float

percent**Strong**: Float

CMDyskineticSymptomResult

percent**Unlikely**: Float

percent**Likely**: Float

CMTremorResult

percent**Unknown**: Float

percent**None**: Float

percent**Slight**: Float

percent**Mild**: Float

percent**Moderate**: Float

percent**Strong**: Float

CMDyskineticSymptomResult

percent**Unlikely**: Float

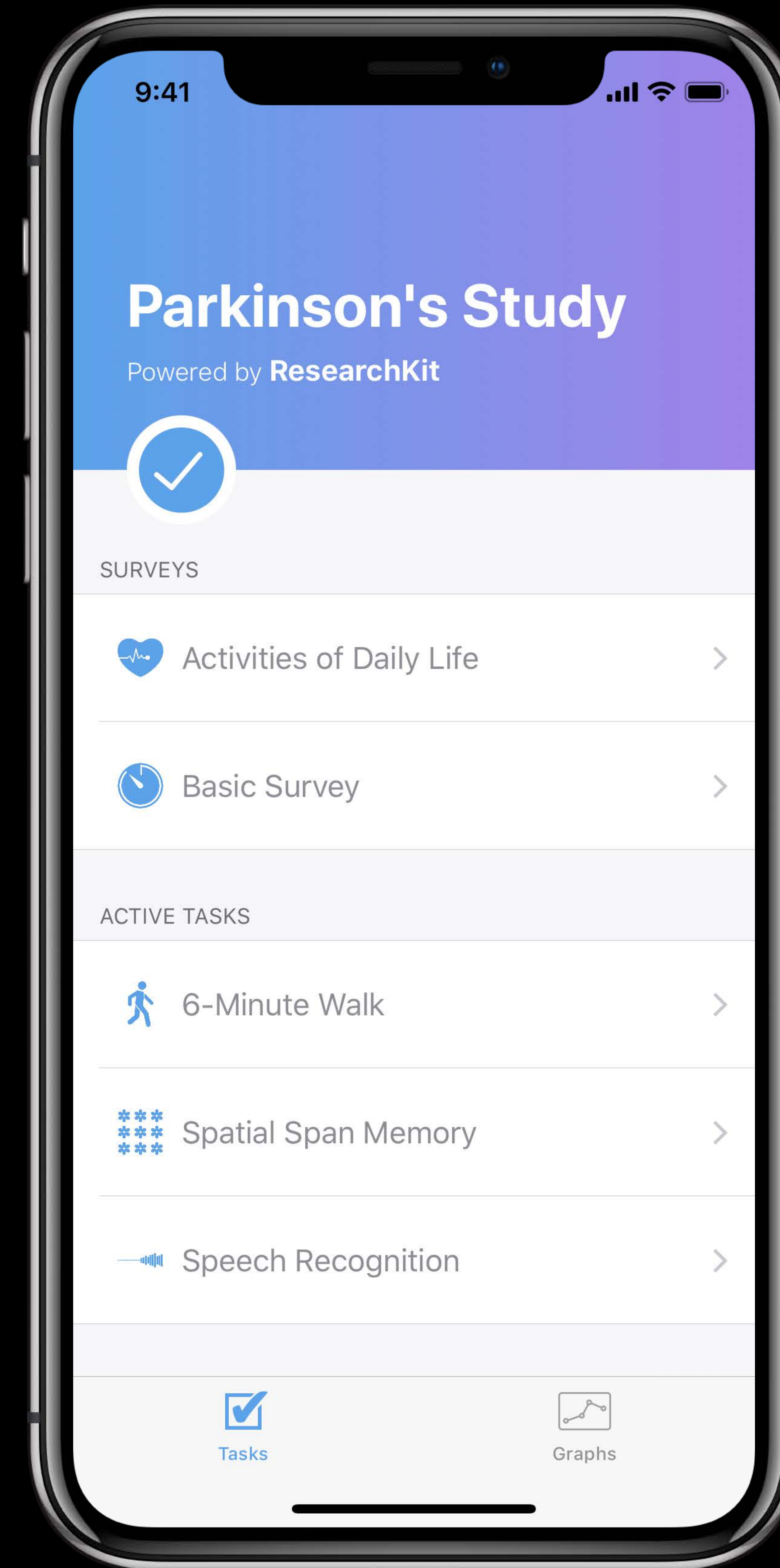
percent**Likely**: Float

Demo

Parkinson's ResearchKit Study App

Akshay Yadav, Software Engineer

watchOS 5
Movement Disorder API



iPhone
ResearchKit Study App

Summary

Summary

ResearchKit

- Community expansion
- Updated UI
- New active tasks

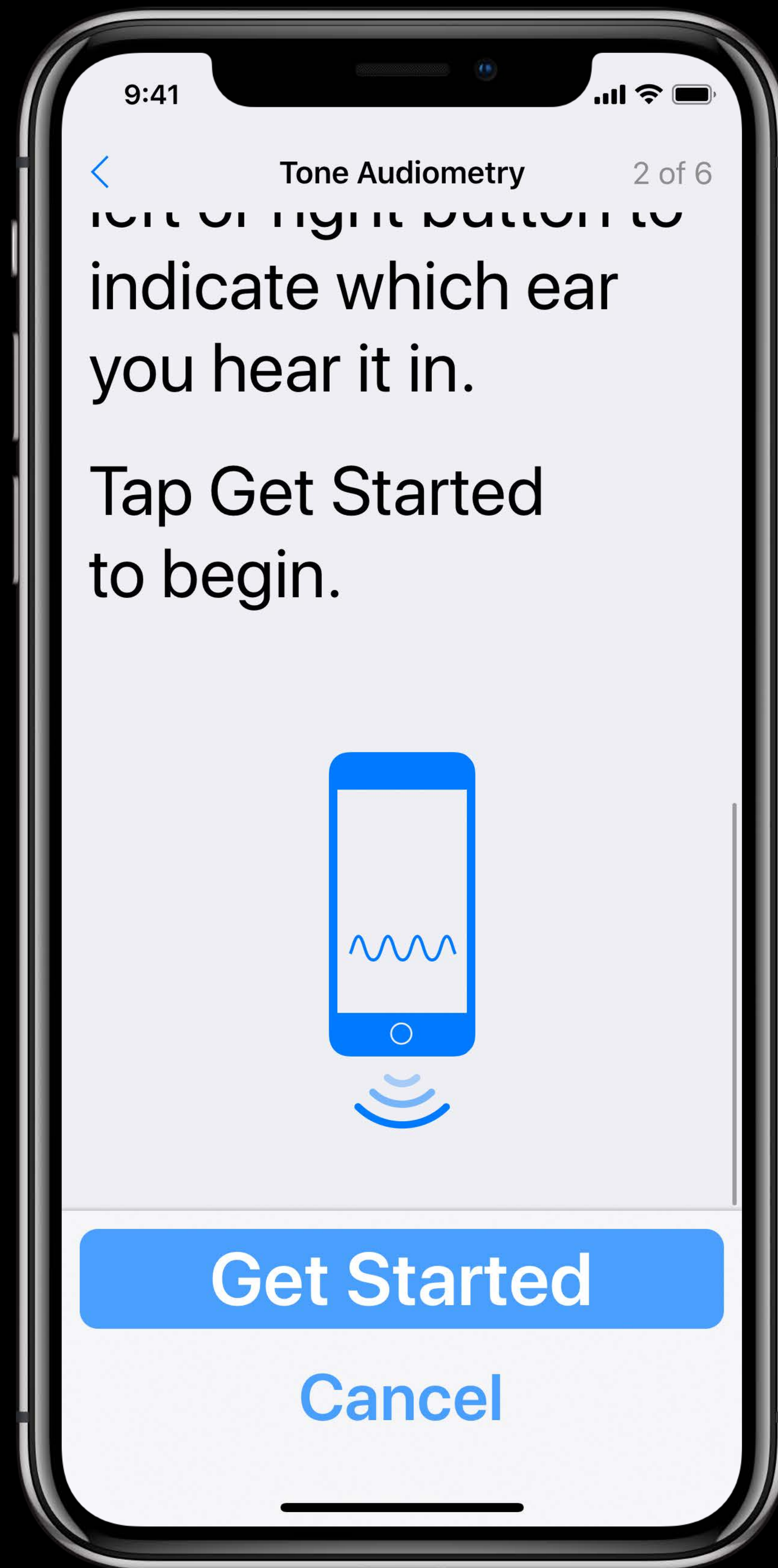
Summary

ResearchKit

- Community expansion
- Updated UI
- New active tasks

Movement Disorder API

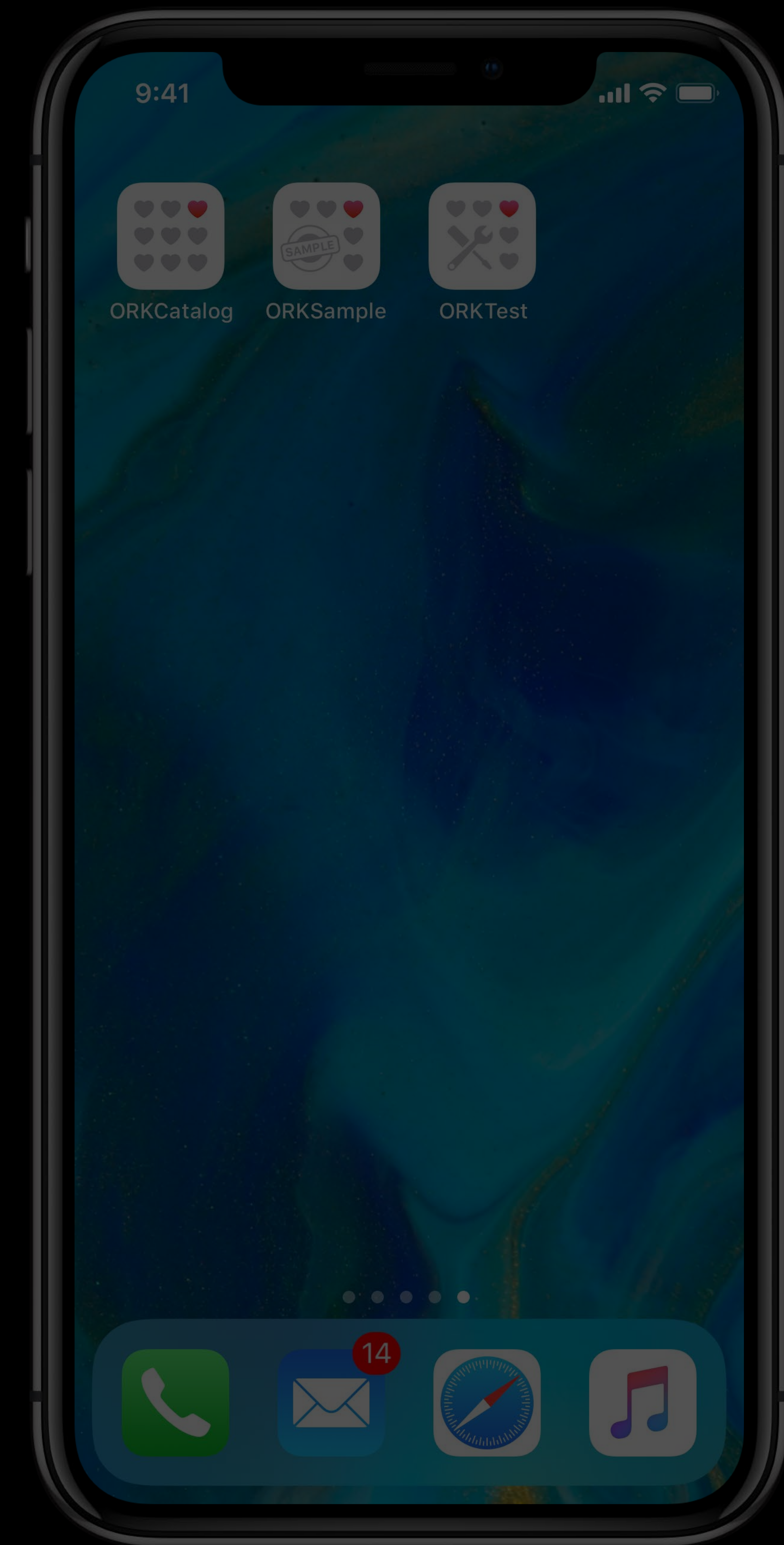
- Available on watchOS 5



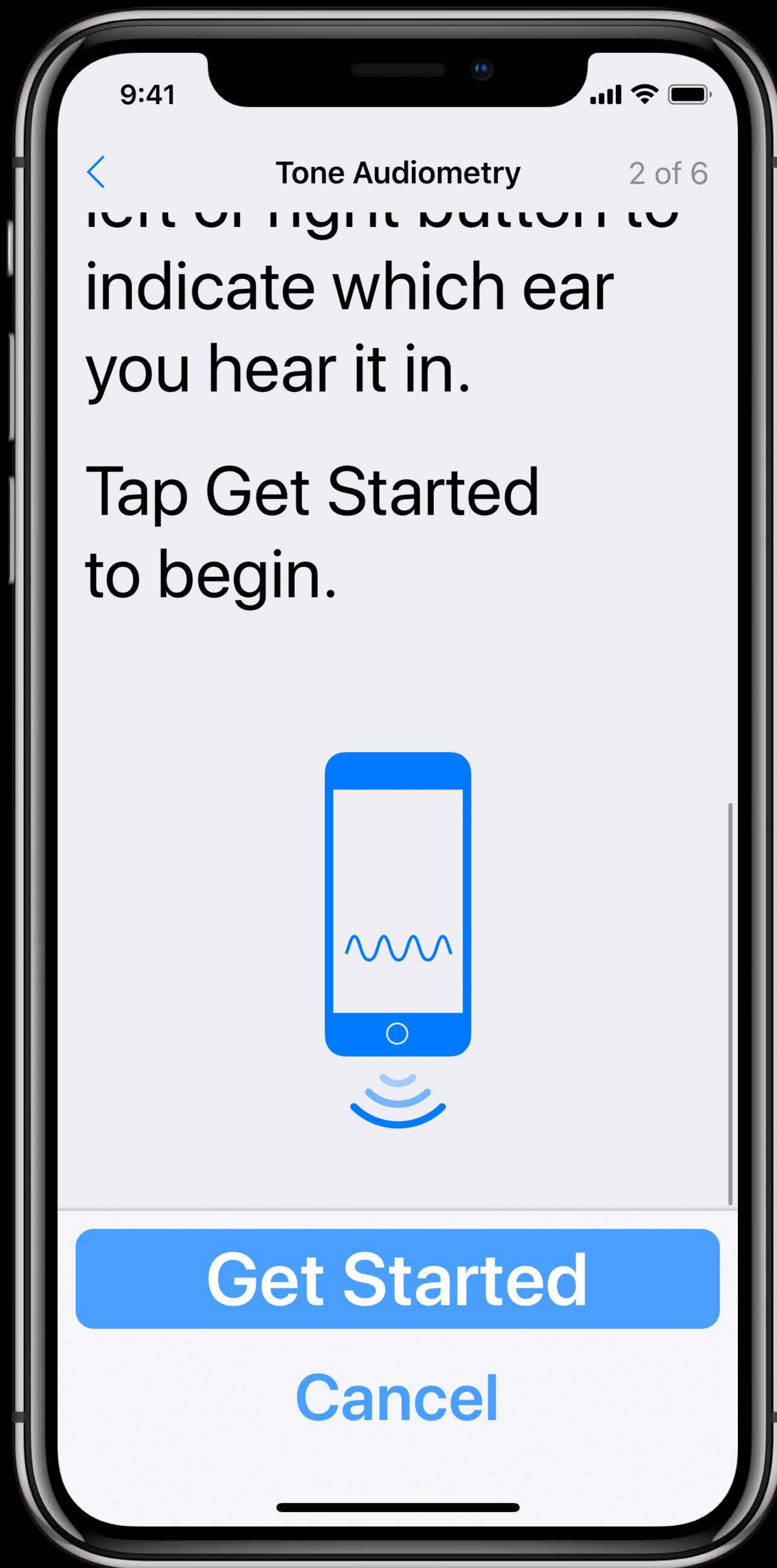
Accessibility



Localization



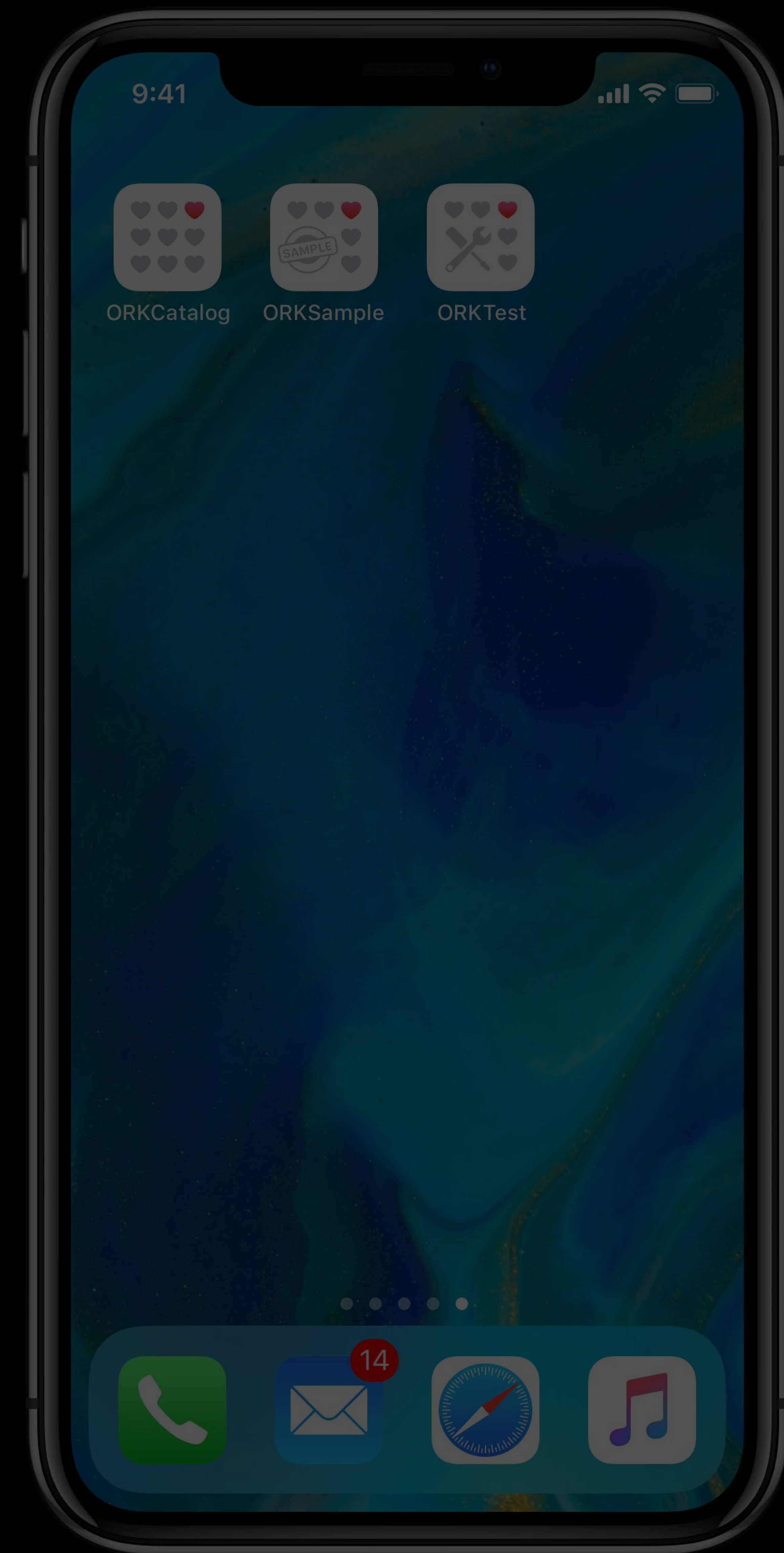
QA



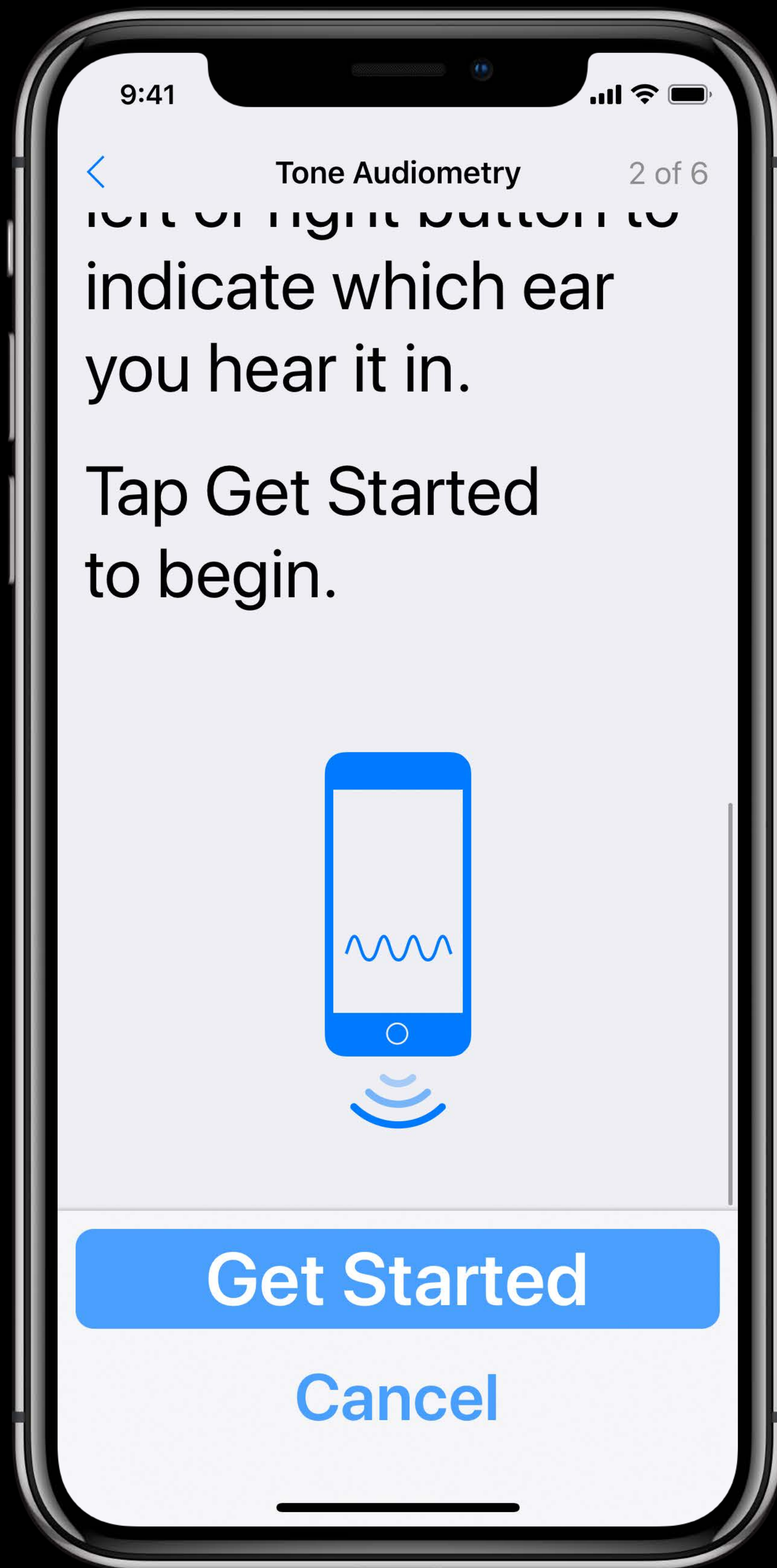
Accessibility



Localization



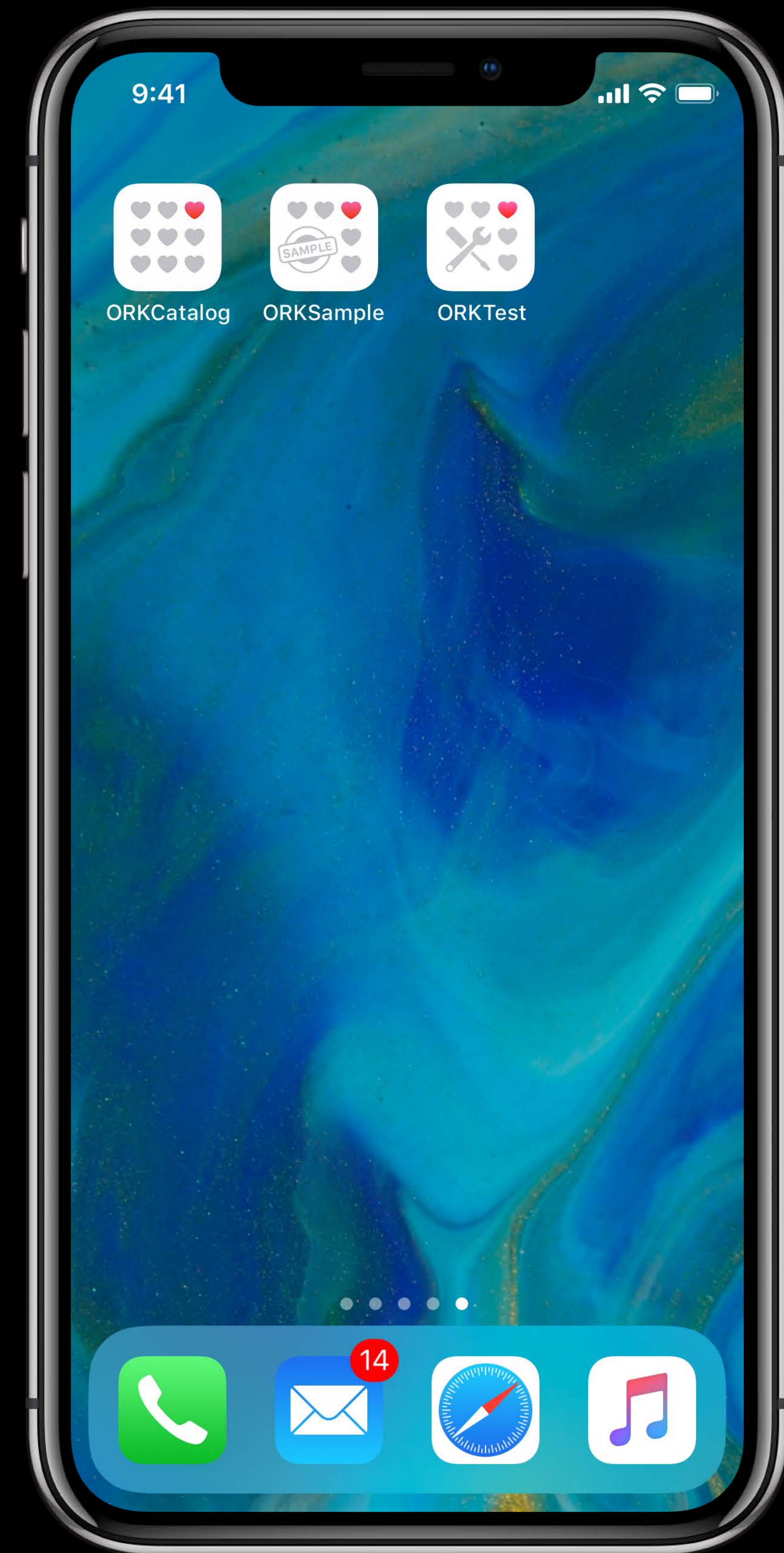
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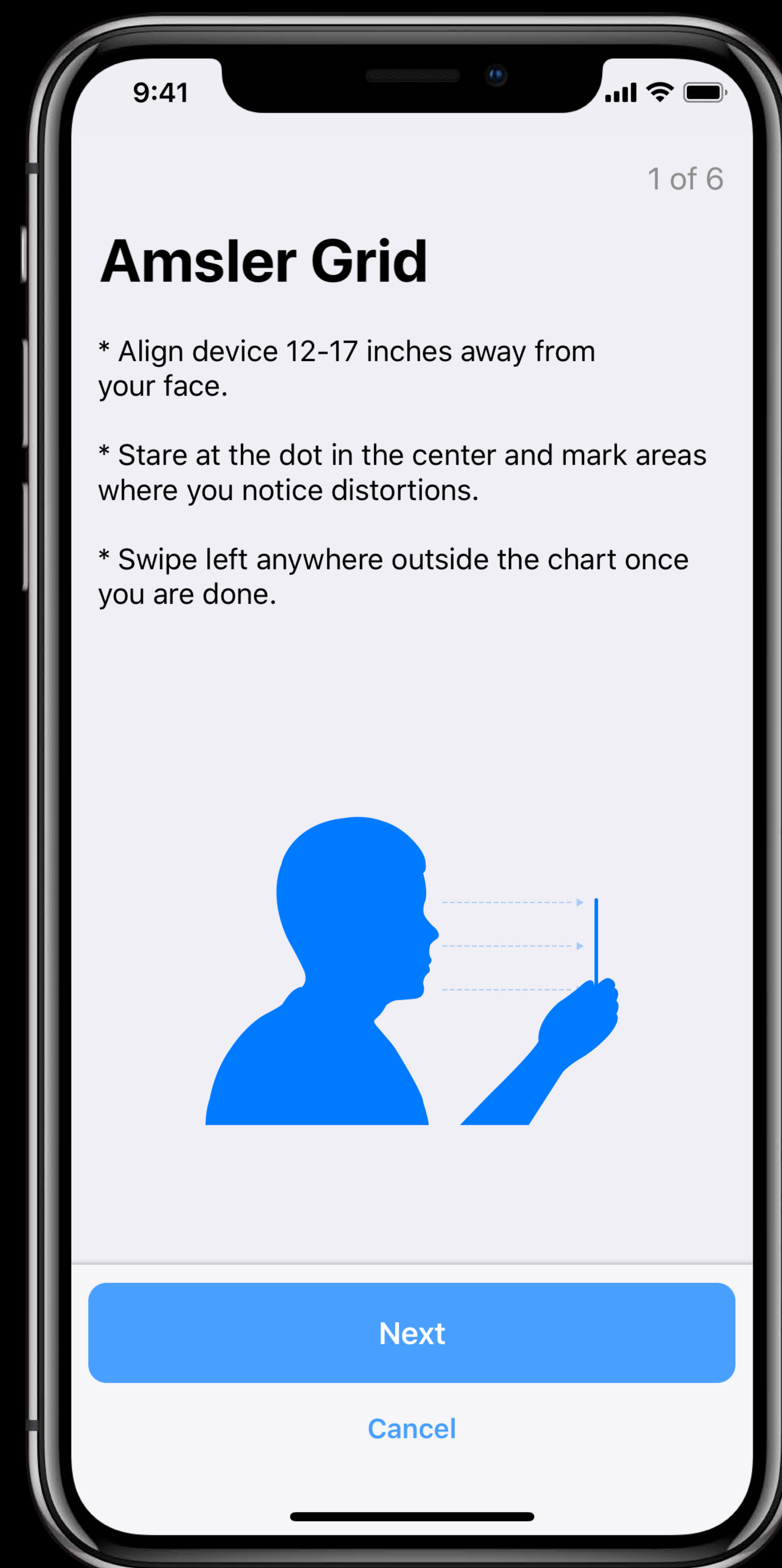
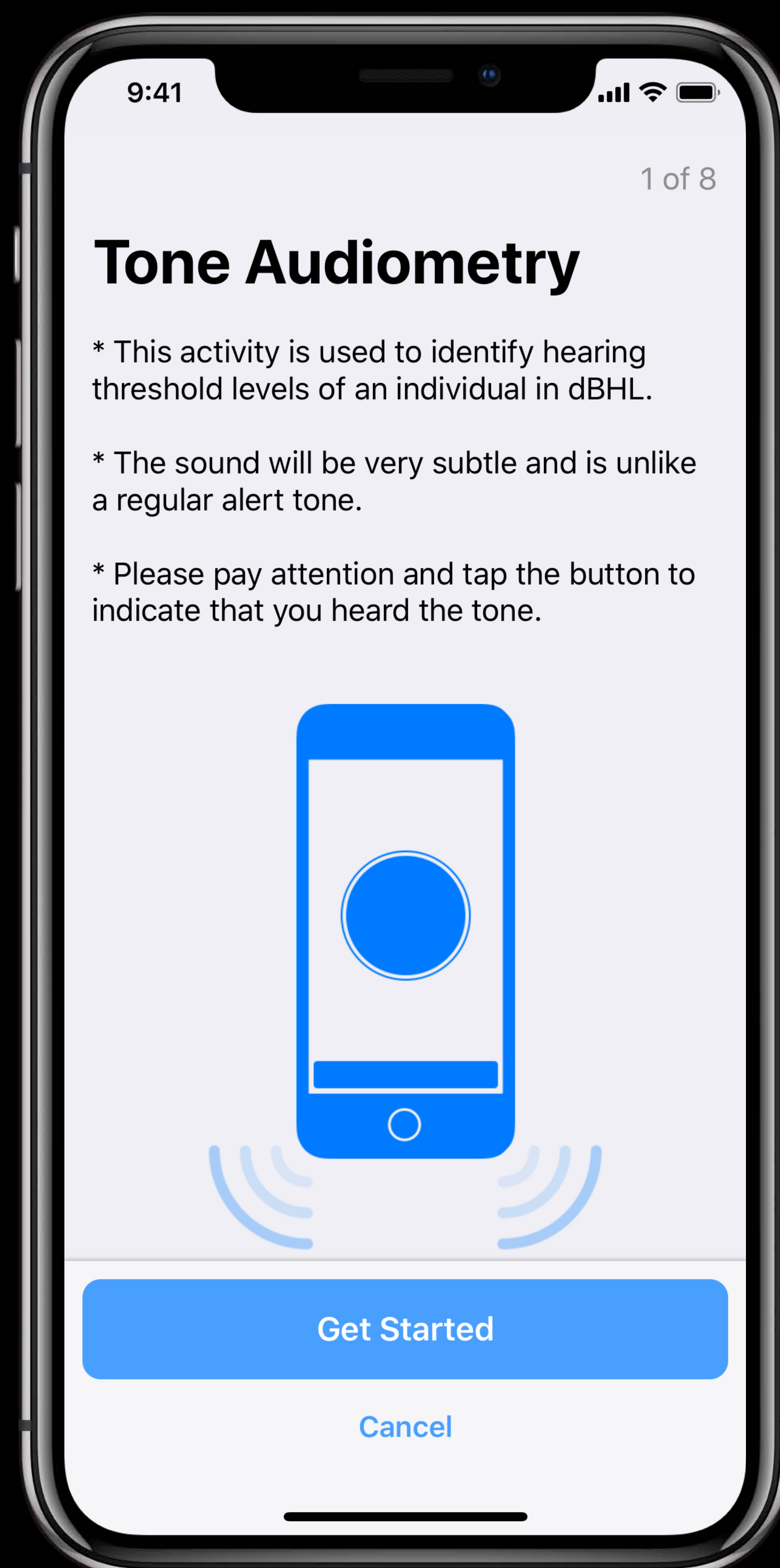
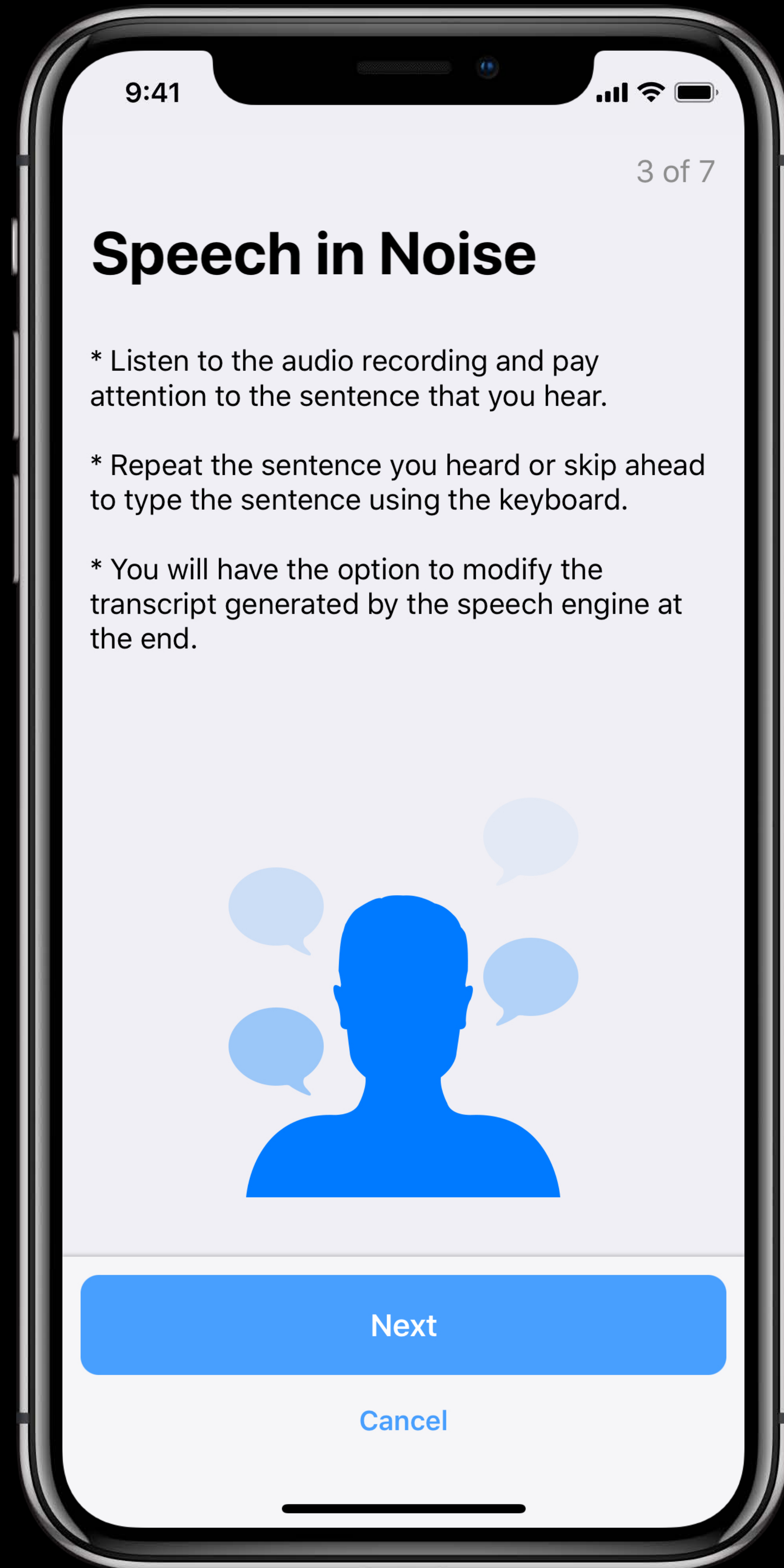
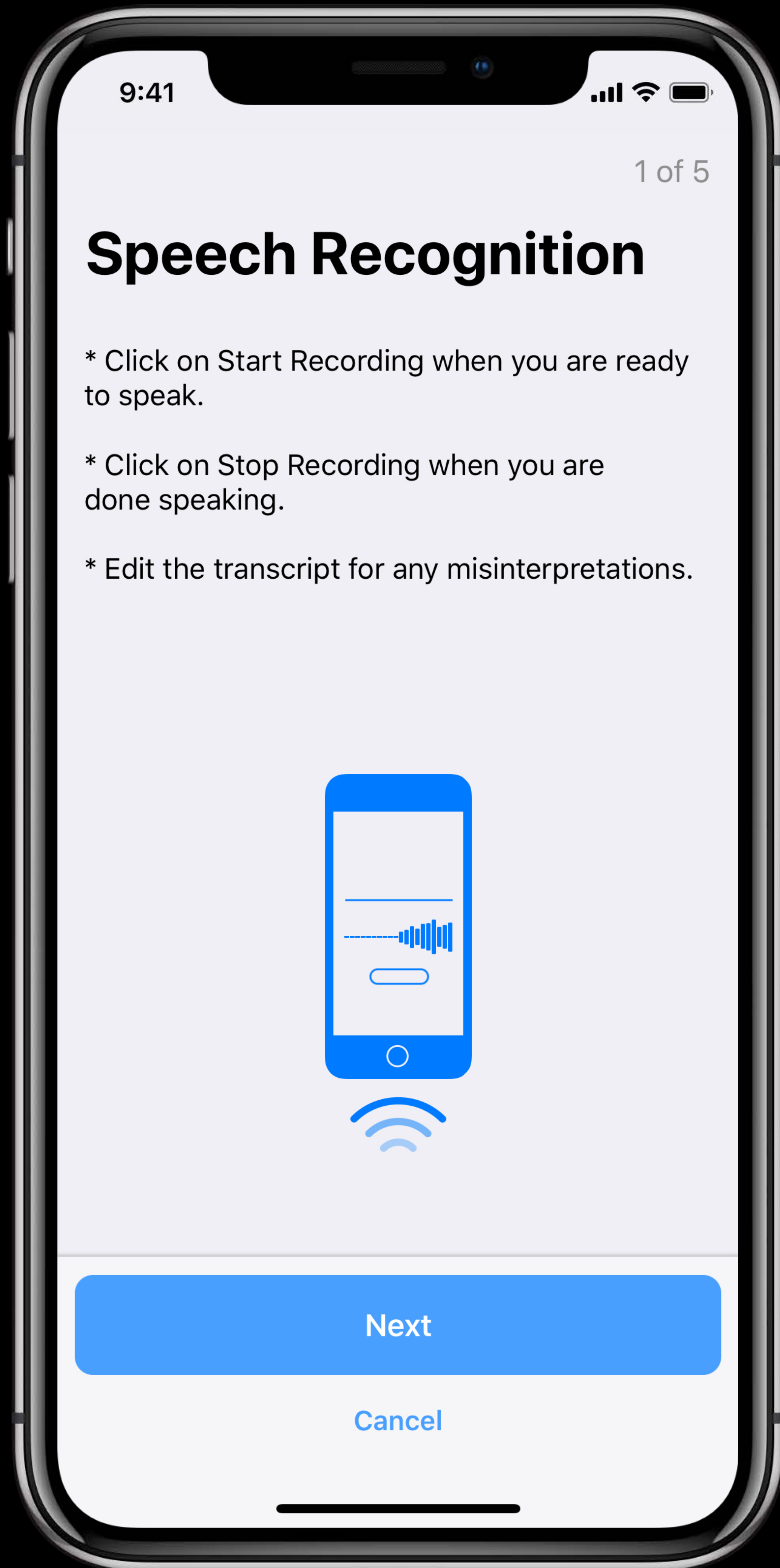
Accessibility



Localization



QA



ResearchKit / ResearchKit Unwatch 296 Unstar 5,072 Fork 975

Code Issues 92 Pull requests 11 Projects 0 Wiki Insights Settings

ResearchKit is an open source software framework that makes it easy to create apps for medical research or for other research projects. Edit

Add topics

2,984 commits 3 branches 14 releases 110 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

srinathm-apple Merge pull request #1104 from srinathm-apple/toneAudiometryCleanup		Latest commit aea49a7 on Apr 12
RKWorkspace.xcworkspace	Checkin the new sample app	3 years ago
ResearchKit.xcodeproj	removing duplicate code	a month ago
ResearchKit	Merge pull request #1104 from srinathm-apple/toneAudiometryCleanup	a month ago
ResearchKitTests	[Misc] Fix additional Xcode 9.1 warnings	6 months ago
Testing/ORKTest	removing duplicate code	a month ago
docs-standalone	[docs] Add first draft of the ResearchKit Reviewing Guidelines	4 months ago
docs	Convergence	10 months ago
samples	Merge pull request #1069 from Br35Ba56/master	3 months ago
scripts	Updating docs to reflect new name of localized strings (ResearchKit.s...	3 years ago
.gitignore	Add .gitignore	3 years ago
CONTRIBUTING.md	Updating docs to reflect new name of localized strings (ResearchKit.s...	3 years ago
LICENSE	Initial commit	3 years ago
README.md	Merge pull request #971 from benjamin-42/update-readme-swift-syntax	6 months ago





Overview Blog

Introducing ResearchKit

ResearchKit is an open source framework introduced by Apple that allows researchers and developers to create powerful apps for medical research. Easily create visual consent flows, real-time dynamic active tasks, and surveys using a variety of customizable modules that you can build upon and share with the community. And since ResearchKit works seamlessly with HealthKit, researchers can access even more relevant data for their studies — like daily step counts, calorie use, and heart rate.

Framework

The core ResearchKit framework offers core modules that include a survey engine, visual consent flow, and active tasks.

The core framework comes with Swift and Objective-C examples, and full conceptual and API documentation. It has also been localized to many languages.

Links

- [Get it on GitHub](#)
- [Documentation](#)
- [API Reference](#)
- [Design Guidelines for Research Apps](#)
- [ResearchKit Forum](#)

ResearchKit Tutorials

These tutorials, along with the ResearchKit documentation, will help you get up and running fast. Please note that these tutorials are authored by members of the ResearchKit community and Apple does not endorse or make any representations as to the accuracy of the content.

- [How to set up a ResearchKit project](#)
- [Advanced ResearchKit Project Setup](#)
- [Learning ResearchKit](#)
- [Accessing Heart Rate Data for Your ResearchKit Study](#)
- [How to create a new ResearchKit Active Task](#)



More Information

<https://developer.apple.com/wwdc18/205>

Health and Fitness Technologies Lab

Technology Lab 1

Tuesday 3:45PM

Accessing Health Records with HealthKit

Executive Ballroom

Tuesday 3:00PM

Health, Fitness, and Research Get-Together

Market Terrace

Wednesday 6:15PM

 **WWDC18**