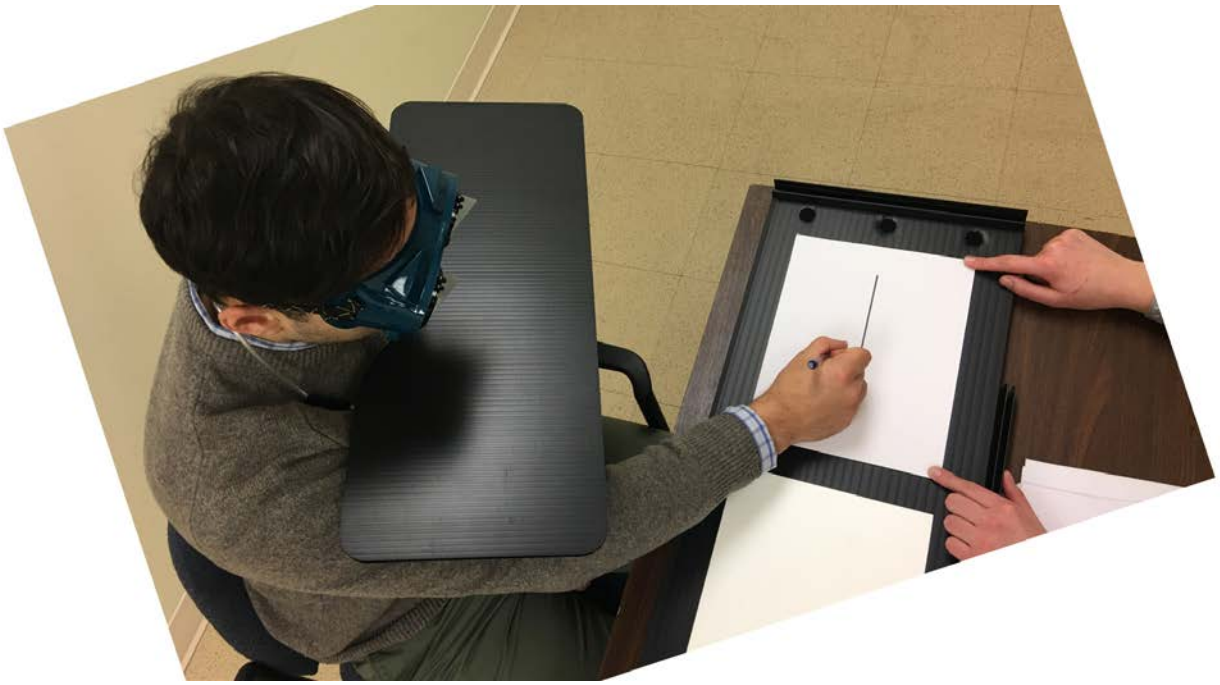
Kessler Foundation
Prism Adaptation Treatment

KF-PAT® 2020 Manual



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Kessler Foundation
Prism Adaptation Treatment Manual

Peii Chen, PhD
Kimberly Hreha, EdD, OTR/L
Kessler Foundation

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It is recommended that the KF-PAT® be administered by trained individuals only. The KF-PAT® may help reduce symptoms of spatial neglect. The Kessler Foundation is not responsible for clinical outcomes.

U.S. Patent # [*** Insert PATENT NUMBER***] for the KF-PAT® wearable system and methods of treatment.

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Preface

I am a cognitive psychologist by training and have become a rehabilitation scientist over the past 12 years or so. In 2008, the year after I came on board to the research group led by A.M. Barrett, MD, at Kessler Foundation, Dr. Barrett received federal funding (NIH/NINDS, R01NS055808) to examine the efficacy of prism adaptation treatment for spatial neglect. I assumed responsibility for implementing the proposed methods into the study procedures. We soon determined that bringing the treatment equipment to study participants was more cost-effective than arranging transfers or transportation to bring participants to the research center. The equipment was quite heavy and was not easily adjustable to participants' body sizes or room settings. At the beginning of Dr. Barrett's second clinical trial (NIDILRR, 90IF0037), I tried a different approach. In 2012, the prototype of the KF-PAT Portable Kit was born, made of cardboard and duct tape. Thanks to an introduction by Mooyeon Oh-Park, MD, I secured the expertise of Geoffrey Hill, CPO, who transformed this prototype into a durable KF-PAT Portable Kit, made of materials that are easily sanitized between uses. In the meantime, the KF-PAT 2012 Manual was drafted to provide therapists with a step-by-step protocol, rather than directing them to the Methods sections of peer-reviewed journal articles.

The last version of the KF-PAT Manual was published in 2018,[1] which was the result of years of user feedback and from my collaboration with Kimberly Hreha, EdD, OTR/L. The 2018 version improved in many aspects, such as the clarification of our instructions, details on recommended modifications, and additional references of the new research that had been published. Dr. Hreha and I have continued working together, offering workshops and providing practical advice and guidance to KF-PAT users all over the country and the world. In the 2020 version of the KF-PAT Portable Kit and the KF-PAT Manual, Dr. Hreha and I again integrated feedback and suggestions from healthcare professionals who provide treatment to individuals with spatial neglect on a daily basis.

The KF-PAT is the result of the collaboration between research staff at Kessler Foundation and clinicians at Kessler Institute for Rehabilitation. Without Dr. Barrett's leadership, there would be no research on prism adaptation at Kessler Foundation. I would especially like to thank Jenny Masmela, all the research assistants of "the Stroke Lab" at Kessler Foundation, and all the occupational therapists at Kessler Institute who tested the early versions of the KF-PAT. I thank Mr. Hill for his generosity in sharing design ideas and material knowledge. I also thank Kelly Goedert, PhD, for her contribution in our previous and ongoing studies on the mechanisms and treatment effects of prism adaptation, and Paola Fortis, PhD, for her unquenchable enthusiasm, pushing us to overcome obstacles encountered during the first clinical research trial.

Peii Chen, PhD @ West Orange, New Jersey | June 2020

I. Introduction

a. Spatial Neglect

Spatial neglect is a syndrome caused by damaged neural networks critical for attention and related functions in the brain.[2-6] Because attention, especially spatial attention, is essential for a wide variety of functions, spatial neglect affects spatial perception (visual, auditory, tactile, proprioception), spatial representation (spatial memory, mental imagery), and motor control (directional movement, mobility).[2,7-11]

It is important to emphasize that spatial neglect is not a visual problem or a visual deficit. Rather, spatial neglect is a neuropsychological syndrome[7] due to brain injury, with visual symptoms, along with other symptoms, present within different sensory modalities. In addition, as briefly stated above, spatial neglect is also manifested in spatial representation and motor control. Therefore, due to the pervasiveness of spatial neglect throughout these systems, it is our recommendation that you assess and treat patients for spatial neglect comprehensively.

Individuals with spatial neglect demonstrate a failure or slowness to respond, orient, or initiate action towards contra-lesional stimuli.[7] This means that affected individuals seldom attend to the side of space contralateral to the injured cerebral hemisphere -- hence "neglect". That is, individuals with spatial neglect after right brain damage "neglect" the left side of space, and those after left brain damage neglect the right side of space.[12-18] While most studies focused on spatial neglect were conducted with individuals with focal brain damage, such as stroke or traumatic brain injury,[19] a few studies investigated the occurrence of spatial neglect in individuals with diffuse brain injuries, and it was found that they usually demonstrate left-sided spatial neglect.[20,21] More studies are required to investigate the mechanisms and presentations of spatial neglect in individuals with diffuse lesions.

Because spatial attention is essential to many perceptual, cognitive, and motor functions, deficits caused by spatial neglect disrupt basic self-care activities (e.g., dressing, grooming),[22] impair postural balance,[23,24] interfere with reading ability,[25-27] and impede navigation (e.g., having difficulty avoiding furniture or walls when walking or using a wheelchair).[28-30] Spatial neglect also increases the risk of falls[31] and body injuries,[32] and puts the affected individuals in danger of being struck by a vehicle when crossing the street.[33,34]

Many individuals with spatial neglect are unaware of their own symptoms or the consequences of their deficits (i.e., anosognosia),[35-39] which delays their seeking appropriate treatment or learning compensatory strategies. The disabling consequences of spatial neglect may last for a number of years after stroke (see an example in **Box 1**).[40-45] Family caregivers of affected individuals reported greater burden and stress than family caregivers of stroke survivors without spatial neglect.[46,47] The profound impact of spatial neglect on stroke survivors and their families underscores the necessity for

Box 1. CW (a research participant) has had left-sided spatial neglect since his stroke three years prior. His wife shared two experiences with us.

1. CW was heating coffee in the microwave. When the alarm went off, he opened the door and found no mug. He shouted in the direction of the living room where his wife was, "*Where is my coffee?*" His wife came to the kitchen and checked the microwave. The mug was positioned on the left side of the microwave's rotating tray. After repeated problems in the kitchen, his wife is concerned for CW's safety and CW has lost the confidence to cook and help with household chores.
2. CW accidentally walked into the ladies' room of a restaurant because he only read MEN on the sign showing WOMEN. His wife apologized to the people using the restroom. After several such embarrassments, CW and his wife rarely go out to restaurants anymore and avoid public places on most days.

implementation of evidence-based treatments.

b. Prism Adaptation

Prism adaptation is a visuomotor phenomenon that has been known since before the 1960s,[48] but not until 1998 did it become a treatment for spatial neglect when Yves Rossetti, MD, PhD and his colleagues reported their findings that prism adaptation was effective in treating spatial neglect.[49] The treatment involves repeated arm movements to visual targets while the entire visual field is shifted horizontally to a certain degree. For treating left-sided neglect, a patient makes arm-reaching movements toward visual targets while wearing prism lenses that shift the visual field certain degrees to the right (e.g., a 20-diopter lens leads to 11.4 degrees of shift). At the beginning of treatment, the patient's arm reaches to the shifted image rather than the actual target (i.e., actual target is to the left of the shifted image; Figure 1.b). Visual feedback regarding the missed target is "sent" to the motor system, which corrects the following reaching trajectories over repetitive practice of reaching toward the target. Eventually success is achieved when an accurate leftward reaching movement is performed to the actual target without hesitation. **This process is called prism adaptation**.

After removing the prisms, the target and its image are now in the same location, but the motor system has adapted to the leftward movement pattern in order to reach an object. Thus, the arm moves toward the left of the target and misses it (Figure 1.d). **This inaccurate performance is called the after-effect**. Albeit inaccurate, the leftward after-effect is critical for improved awareness of the left side of space in patients who seldom spontaneously initiate exploration of that space. Research is currently ongoing to determine the neuro-rehabilitative mechanisms underlying the effect of prism adaptation treatment on spatial abilities, daily activities, and long-term improvement. Nonetheless, it is known that prism adaptation helps bring attention and awareness to in the neglected side of space and helps individuals perform everyday activities. This initiates a cycle of proficiency of attention control that helps perpetuate improved functional abilities. Thus, after completing the treatment course, patients may demonstrate a more balanced or centered posture while sitting or standing,[50,51] navigate through different environments more efficiently and safely,[52-54] and improve their ability to read and write.[55-60]

[*** DESIGN- We need to change this figure due to copyright. Keep the basic 5 panel format. Replace balls with a vertical pen. In addition, in panel a, make a dark shaded area on the left half of the box (to represent spatial neglect). Don't include that shading in b – d. Include that shading again in e, but make it only the left ¼ of the box.

Text:

a) Before treatment
b) Prism adaptation goggles initially worn
c) Prism adaptation occurs
d) Goggles removed- Prism aftereffect
e) After-effect disappears, spatial neglect improved

Text below:

Figure 1. Illustrated process of prism adaptation (actual target is black pen and perceived image of target is white). a) Spatial neglect present. b) Goggles initially shift the image of the pen to the right, which the patient targets. c)

Patient adapts to the shift and learns to target the real object. d) Goggles are removed. Due to after-effect, patient targets space to the left of the actual object. e) Prism after-effect has disappeared. Patient targets actual object. After repeated sessions, spatial neglect improves.

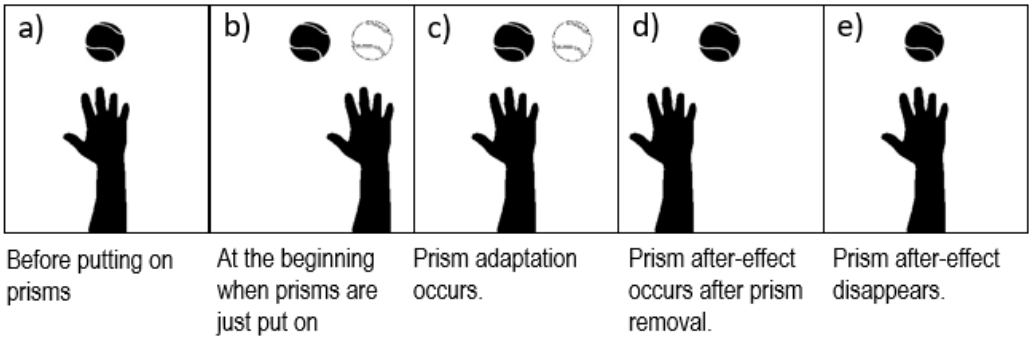


Figure 1. Arm reaching toward a visual target (actual target in black and the image of the target in white) before, during, and after prism adaptation. a) Reaching toward the target before wearing the prisms. b) Reaching toward the image of the target at the beginning of exposing to prisms shifting the visual field to the right. c) Reaching toward the target with no deviation, i.e., prism adaptation has occurred. d) Prism after-effect, showed as reaching toward the target that ends on the left side of the target after prism removal. e) After a few seconds to minutes, the prism after-effect disappears.

Prism adaptation and its after-effect occur naturally, requiring no effortful strategy learning, through cortico-cerebellar connectivity.[61,62] To treat left-sided neglect, left-based wedge lenses (left side of lens elongated) are used in the treatment and right-based wedge lenses (right side elongated) to treat right-sided neglect. This process is reversed in left-right direction, with the opposite shift in visual field and motor adaptation to perceived stimuli, for individuals with right-sided neglect.

c. Measures of Prism After-Effects

It is important to measure prism after-effects (described below). If a patient does not show any after-effect for three consecutive sessions, it means that their cortio-cerebellar connectivity may be impaired, and they may not benefit from prism adaptation treatment at all or has benefitted as much as is possible. If there are three sessions where no after-effect occurs, it is suggested to discontinue treatment.

The KF-PAT administration protocol has two built-in assessments of pointing performance both administered before and after prism adaptation to help you detect and measure prism after-effects in two different ways. The two assessments are Proprioceptive Pointing and Visual-Proprioceptive Pointing.

Proprioceptive Pointing

During the Proprioceptive Pointing task, patients will point straight ahead while blindfolded. You will assess patient's deviation from the patient's midline. This task assesses the patient's innate sense of proprioception without visual cues. That is, they rely on their proprioception to make the movement.

Visual-Proprioceptive Pointing

During these tasks, patients will point at a visual target (hence "visual" in the name of this task), i.e., a pen held up by the therapist, while they are blocked from seeing their own arm, hand, or fingers when making the reaching and pointing movement (hence "proprioceptive" in the name of the task). You

will assess the deviation of patient's pointing, which indicates the (mis)alignment between the patient's visual and motor systems.

After-Effect

As stated, both pointing tasks are administered before and after prism adaptation, thus creating four assessment conditions:

Before Prism Adaptation (Baseline)

1. Proprioceptive Pointing
2. Visual-Proprioceptive Pointing

After Prism Adaptation

1. Proprioceptive Pointing
2. Visual-Proprioceptive Pointing

In other words, a baseline pointing performance will be established before prism goggles are put on the patient, and then after prism goggles are removed, the patient's pointing performance is assessed again. In both assessments you will measure the deviation of the patient's ability to point to a target (either midline in Proprioceptive Pointing or an indicated target in Visual-Proprioceptive Pointing). There will be 10 measurements for each of the Proprioceptive Pointing assessments and six measurements for each of the Visual-Proprioceptive Pointing assessments. These measurements will be averaged, creating an error score for each of the assessments. The difference between the performance before and after prism adaptation within each assessment in terms of average errors indicates prism after-effects.

After-Effects

Proprioceptive After-Effect = Proprioceptive Pointing (Before) Average Errors – Proprioceptive Pointing (After) Average Errors

Visual-Proprioceptive After-Effect = Visual-Proprioceptive Pointing (Before) Average Errors – Visual-Proprioceptive Pointing (After) Average Errors

As stated, the errors are a measurement of the deviation from where the patient points compared to the target. After adapting to left-based prisms, the errors should be left of the baseline errors. After adapting to right-based prisms, the errors should be right of the baseline errors. In other words, whether the baseline errors are in the patient's left or right side of space is irrelevant. What is important is determining if an after-effect has occurred. The magnitude of the after-effects does not predict the extent of neglect amelioration or functional improvement.

The following figures (2 and 3) show typical patterns of pointing before (a) and after (b) prism adaptation when using left-based prisms (for left-side neglect) and illustrate the same after-effect, though pointing has occurred on different sides of midline (0).

Figure 2a. Before Prism Adaptation

[* DESIGN- Create a numberline as if on a board for following figures. Below numberlines, create an arm with finger pointing to number with dotted line connecting pointing finger to number. In 2a. pointing to - 3. In 2b. pointing to -1.**

… +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5…

Figure 2b. After Prism Adaptation

… +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5…

In the above figures, the patient has pointed at "-3" before prism adaptation and "-1" afterwards. Though this is only one trial (and after-effect is measured as a difference of the average errors for all the trials), the after-effect would be "-2" in this example.

Figure 3a. Before Prism Adaptation

[* DESIGN- Create a numberline as if on a board for following figures. Below numberlines, create an arm with finger pointing to number with dotted line connecting pointing finger to number. In 3a. pointing to +1. In 3b. pointing to +3.**

… +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5…

Figure 3b. After Prism Adaptation

… +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5…

In the above figures, the patient has pointed at "+1" before prism adaptation and "+3" afterwards. Though this is only one trial (and after-effect is measured as a difference of the average errors for all the trials), the after-effect would also be "-2" in this example, the same as shown in Figure 2.

You may use the baseline errors to track the patient's progress from session to session. Proprioceptive Pointing performance is an indication of the patient's self-perceived body center. Visual-Proprioceptive Pointing can indicate the ability to integrate visual and proprioceptive information.

Some patients may demonstrate affect-effects in both pointing tasks, and others may show it in one pointing task but not the other. We suggest you continue administering pointing tasks before and after prism adaption in every single session. Only when no after-effect is observed for three consecutive sessions, or 10 sessions of prism adaptation treatment have been completed, should you switch to a different treatment.

d. Course of Treatment

Prism adaptation and its after-effect occurs naturally, requiring no effortful top-down strategy or conscious self-monitoring. Patients do not need to memorize instructions or explicitly learn a skill. These are important features of the treatment because people with brain injury from stroke or other causes can have a great deal of difficulty learning new skills, consciously using them, and monitoring their use.

We and other independent researchers have demonstrated that usually after 10 daily sessions of no longer than 20 minutes per session per day, patients show improvement in neglect symptoms and functional activities.[63-65] The treatment is not typically uncomfortable nor does it require a great deal of physical exertion, thus making participation manageable and completion of treatment attainable by the majority of individuals who might have spatial neglect as a result of stroke (see in Administration section below for exclusionary criteria for patients who may not be appropriate).

While there are different treatment courses depending on different treatment procedures, here we recommend the KF-PAT course of 10 once-daily sessions over two weeks. Ideally, the 10 sessions are delivered once a day for 10 consecutive days [*** INSERT REFERENCE IF AVAILABLE]. However, in our previous studies and many other studies, it was found that skipping weekends is acceptable. Nonetheless, we do not recommend skipping more than 2 days during the treatment course.

If you are providing the treatment during a regular occupational therapy (OT) or physical therapy (PT) session, we suggest you do so as the first activity of the session and carry out other OT or PT activities after KF-PAT. As mentioned above, the after-effects occur naturally and help the patient orient toward their body center or toward the neglected side of space. This can be beneficial for them to participate in therapy sessions.

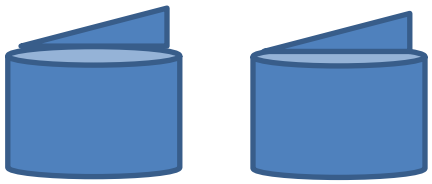
A therapist should complete all the treatment procedures in a given session. A therapy aide may help set up the equipment, but we suggest certified/licensed occupational (OTs) or physical therapists (PTs) go through all the visuomotor activities with the patient (see Therapist Qualifications section below). This is because an OT or PT is specifically trained to observe therapy engagement. You have the knowledge and professional experience to determine if modifications are necessary and performance details that an aide may not be able to do. During the 10-day treatment course, different therapists can administer on different days as long as the same therapist completes that day's session. This is essential in order to obtain accurate prism after-effects measurements .

Figure 4. Goggles fitted with 20-diopter wedged prism lenses.

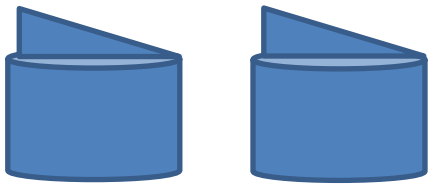
In this manual, we provide instructions for treating left-sided spatial neglect (after right-brain damage). However, you may follow the same principles to treat right-sided spatial neglect but use the right-based prism lenses and adapt directions to the opposite spatial direction (right side thicker; see the goggles with the orange-colored sticker in Figure 4.

Figure 5. Top-down View of

a. **Right-Based Prism Goggles for Right-Side Neglect**
[* DESIGN- NEED TWO CYLINDERS TO REPRESENT GOGGLES WITH ~ 11 DEGREE TILT TO RIGHT ON TOP- each goggle should be one continuous cylinder]**



b. **Left-Based Prism Goggles for Left-Side Neglect**
[* DESIGN- NEED TWO CYLINDERS TO REPRESENT GOGGLES WITH ~ 11 DEGREE TILT TO LEFT ON TOP]**



II. Unique Features

a. Portable Equipment

The KF-PAT Portable Kit provides an implementation solution for clinicians who wish to follow evidence-based best-practice guidelines[66,67] and utilize prism adaptation treatment for their patients with spatial neglect in a variety of settings. Currently the KF-PAT Portable Kit is the only readily available product that provides all the necessary devices to facilitate a systematic treatment course. The KF-PAT Portable Kit includes (a list of parts follows below) two pairs of prism goggles (one for left-sided neglect and the other for right-sided neglect), the visual field occluder (for enhancing prism after-effects), a workspace board (for facilitating the placement of visual targets), a large transparent ruler (for measuring prism after-effects), a foldable board and an opaque apron (both for building an apparatus for the Visual-Proprioceptive Pointing task). All the parts are lightweight and easy to wipe clean. There are no electronic components. The boards and prism lenses are made of polycarbonate materials. The opaque goggles frame is rubber with an adjustable elastic strap. The frame holding the wearable visual field occluder is aluminum. Velcro is used to attach parts together, such as the visual field occluder and the foldable board.

The innovation of this system is the visual field occluder, which makes the system portable (Patent # [*** INSERT PATENT NO WHEN AVAILABLE]). Numerous groups around the world have studied prism adaptation treatment for spatial neglect since Rossetti et al.'s 1998 article was published in *Nature*.[49] One apparatus commonly used in research among these groups is the "prism adaptation box," which is to occlude the view of the arm movement while wearing the prism goggles, for the purpose of enhancing prism after-effects. In these studies, the box was stationary, non-moveable,[60,68-70] and usually non-flexible to different individuals' shoulder heights. Patients are required to stay very close to the box and even

position their chin into a “chin rest”. This setting requires patients to travel where the prism adaptation box is located, and thus may discourage patients’ participation if they have limited mobility (e.g., difficulty in arranging transportation). Our invention, the visual field occluder provides a solution to the mobility problems of the prism adaptation box as it is “wearable” and serves the purpose of blocking the view of arm movements and allowing the view of the hand to reach the visual target. Patients can move their head and torso easily with it. Because of the visual field occluder, now the system of treatment devices (the entire KF-PAT kit) can be neatly stored in a bag and brought to the patient. Also, because the KF-PAT is portable, prism adaptation treatment can be delivered by trained specialists in various settings, including an inpatient gym, hospital bedside, outpatient examination room, and residential house.

Since the first generation of the KF-PAT Portable Kit (released in 2014), we have collected user feedback from clinicians in a number of settings. Clinicians reported great satisfaction using the KF-PAT Portable Kit and shared how they integrated prism adaptation treatment in their regular therapy sessions. Occupational therapists (OTs) are using the KF-PAT more often than other disciplines such as physical therapists (PTs), psychologists, neurologists, or physiatrists. In the U.S. rehabilitation healthcare model, a therapy session is 45 minutes inpatient and approximately one hour in the outpatient setting. The majority of OTs reported that they usually started a session with the KF-PAT, which takes 15-20 minutes, and then complete other therapy activities. Therapists’ reasoning includes that prism adaptation “gets patients ready” or “orients them more to the neglected side of space”, and thus helps facilitate other activities in the session. Therapists in acute care hospitals (e.g., a medical center with ER and ICU) reported that they would use the KF-PAT bedside if a given patient was not able to leave the bed; they would sit up the patient on the bed, and use the tray table that fits over the bed to deliver prism adaptation treatment. In our research studies, research staff brought the KF-PAT Portable Kit to patients’ homes to complete treatment. At home settings, the only requirement is that there is a table or desk that can hold the workspace board of the KF-PAT. We have used coffee tables, dinner tables, and computer desks. Thus, the KF-PAT Portable Kit is truly portable and can be used in various settings.

b. Evidence-based treatment

Prism adaptation treatment is recommended for spatial neglect in the stroke rehabilitation practice guidelines published in 2016 by the American Heart/Stroke Association’s guidelines[66] and the Canadian Stroke Best Practice Recommendations.[67] Specifically, based on Level A evidence (multiple populations evaluated using randomized clinical trials or meta-analyses), prism adaptation treatment is considered “benefit much greater than risk” and “reasonable to perform” by the American Heart/Stroke Association. [66] We at Kessler Foundation[63-65,71-76] and many others have studied prism adaptation for treating spatial neglect. Systematic reviews and meta-analyses.[77-80] have shown positive therapeutic effects of prism adaptation treatment.

III. Eligible Patients

a. Inclusion Criterion

The following criterion describes qualities of individuals who would likely benefit from participation in KF-PAT treatment.

- Patients who present with **spatial neglect** as determined by standardized assessment(s). Patients with any degree of spatial neglect may benefit from prism adaptation treatment. We recommend all neurologically impaired individuals are assessed for spatial neglect, regardless of if you think that they have spatial neglect or not. This is essential for best practice and accurate detection.

  To detect the presence and measure the severity of spatial neglect, we suggest using the Catherine Bergego Scale[81] via the Kessler Foundation Neglect Assessment Process (KF-NAP®),[82] the Behavioral Inattention Test (BIT),[83] the Sunnybrook Neglect Assessment Procedure (SNAP),[84] or a combination of various assessments recommended in recent reviews.[85] We do not recommend using patients' self-reports or family members' reports to determine the presence or severity of spatial neglect due to inaccuracies and lack of awareness of these informant reports.

b. Exclusion Criteria

The following are exclusionary criteria, the presence of which would indicate that the individual is likely not a suitable candidate for participation in KF-PAT treatment.

- Patients who have a history of vertigo, which results from a disturbance of the body's balancing mechanism, located in the inner ear. A sudden shift of the visual field can cause dizziness, which may be severe in people with vertigo.
- Patients who have lesions or functional impairment in the cerebellum, which is critical to prism adaptation (see the Introduction section).
- Patients who have severe motor ataxia, which will prevent proper control of arm movements that are essential to prism adaptation.
- Patients who are blind in both eyes.
- Patients unable to perform the gestures needed to engage in KF-PAT treatment. If there is a doubt, you should ask patients to perform the actions necessary in treatment:
    - Bring the less affected hand to chest
    - Point forward
    - Grasp a pen or marker
    - Draw a line

The majority of the published studies were focused on individuals with spatial neglect after stroke, and very few investigated individuals after other types of brain injuries. Even within the stroke population, most studies included individuals with first stroke, especially right-brain stroke, and excluded those with other or prior neurological conditions. Data on multiple strokes or other types of brain injuries are very limited as of today,[86] but the theoretical treatment mechanisms are generalizable to those populations. Some therapists have tried KF-PAT with patients who had acquired brain injuries other than stroke, and reported to us that they saw good results.[87] Nonetheless, we do not have sufficient information to make specific recommendations. We suggest you use your clinical judgement and keep updated with the literature.

IV. Therapist Qualifications

a. Qualifications

You should have advanced training and/or educational degree with advanced coursework in neuro-rehabilitation of individuals with stroke or brain injury, or work under the license of someone with these credentials. Qualifications that typically fulfill these qualification requirements are: occupational therapists (OTs), physical therapists aka physiotherapists (PTs), speech and language pathologists (SLPs), clinical psychologists, neuropsychologists, neurologists, and physiatrists.

If you are not a rehabilitation specialist or if you are using the KF-PAT in a research setting, it is necessary that you contact Kessler Foundation (can be contacted through Stoelting- see contact information on title page) to acquire necessary training.

b. Training

To be considered trained to use the KF-PAT, you should meet the above qualification requirements and, at a minimum, have done the following:

- **Read this manual in its entirety**. It is important to read this entire manual, not just these Administration Directions, to understand the correct use and application of the KF-PAT.
- **Practice administering the KF-PAT at least two times** with a colleague role-playing a typical individual meeting inclusionary criteria. The entire sequence of treatment in one session should be administered. The colleague role-playing the patient should attempt to add some mildly challenging obstacles for the training clinician in the second role-play, such as not returning their hand to the starting position or moving their arm too fast when pointing during Proprioceptive Pointing. This would then provide you an opportunity to practice negotiating these obstacles prior to working with an actual patient.
- **Conduct the first patient session under observation or consultation with a therapist who has already been trained and meets these requirements.** Alternatively, if a trained therapist is not available, the publishers of the KF-PAT may be consulted (see contact information on title page) should clinical questions arise or for guidance in administration.

The goal upon completing training is that you are able to administer all the procedures by yourself in one session and over the course of therapy without consulting the Manual for directions and only referencing the Scoring Sheet with abbreviated directions and verbal prompts, and be able to properly document session performance. As there is a great deal of content to relay to patients, actions to be performed, observations needed, and rapport necessary, it is not possible to lead an effective KF-PAT treatment session while reading the manual.

Trainings with a KF-PAT expert are available either via live training or web-based training. See the KF-PAT webpage (https://www.stoeltingco.com/kessler-foundation-prism-adaptation-treatment-kf-pat-for-spatial-negl) for additional information about these options.