DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Silver Spring, MD 20993-0002

Summary of the Neurological Devices Panel Meeting April 24, 2014

Introduction:

The Neurological Devices Panel of the Medical Devices Advisory Committee to the Food and Drug Administration met on April 24, 2014 the Panel to discuss the current knowledge about the safety and effectiveness of aversive conditioning devices that are intended to deliver a noxious electrical stimulus to a patient to modify undesirable behavioral characteristics in patients with self-injurious behavior (SIB) and aggressive behavior. FDA sought clinical and scientific expert opinion on the risks and benefits of electrical stimulation devices (ESDs) for aversive conditioning devices based on available scientific data and information. The agency is considering whether to ban aversive conditioning devices that are intended to administer a noxious electrical stimulus to a patient to modify undesirable behavioral characteristics in patients with SIB and aggressive behavior. The meeting will concern only devices classified under 21 CFR 882.5235 (aversive conditioning device, class II) that are not self-administered. Devices that deliver a noxious electrical stimulus automatically are not considered to be self-administered devices.

FDA Presentation

Kristen A. Bowsher, Ph.D., Vincent Amatrudo, J.D., Peter G. Como, Ph.D., Lawrence Park, M.D., and Michelle Roth-Cline presented for the FDA. They provided information on the FDA standard for banning, the regulatory history of ESDs for aversive conditioning, a device description, clinical background information regarding SIB and aggressive behavior as presented in the literature, the benefits and risks of ESDs for aversive conditioning based on all available information, and the ethical considerations with a particular focus on issues related to clinical studies.

Affected Firm Presentation

One center in the United States presented on using ESDs for aversive conditioning in patients with SIB and aggressive behavior, namely the Judge Rotenberg Center (JRC) in Massachusetts. The JRC provided background information on the Center and indicated that they often receive patients with extraordinary behavior disorders who have been expelled from or refused admission to other treatment centers. They provided a description of the device used at the center (the GED-3A and GED 4), a regulatory history, a description of the types of evaluations performed on the patients, the requirements that must be met prior to use of ESDs, and patient monitoring procedures. They also discussed the safety and efficacy of device use at the JRC and provided examples of patients who experienced reductions in problem behaviors with positive results in skill and academic achievement with no reported side effects.

Open Public Hearing – Professional Societies:

The professional societies listed below registered for the professional societies session of the Open Public Hearing during this meeting. Each agency listed below was given approximately 4 minutes to present before the panel.

1. American Association on Intellectual and Developmental Disabilities (AAIDD)
2. TASH: Equity, Opportunity, and Inclusion for People with Disabilities Since 1975
3. Association of University Centers on Disabilities
4. Autistic Self Advocacy Network
5. Disability Rights International
6. Disability Law Center
7. National Association of State Directors of Developmental Disability Services
8. National Leadership Consortium on Developmental Disabilities at the University of Delaware
9. Queens College Regional Center for Autism Spectrum Disorders
10. The Arc of the US
11. National Disability Rights Network
12. National Association of Councils on Developmental Disabilities
13. BRI Parents & Friends Association
14. Gateways: Educational and Behavioral Consultation Services
15. ACLU
16. Occupy JRC
17. TASH: New England

Open Public Hearing – General:

The concerned citizens listed below registered for the General Open public hearing session of this meeting. Each individual was given approximately 3 minutes to present; with the exception of Vito Albanese Sr., who requested to speak the morning of the meeting. Mr. Albanese was granted 1 minute to provide his comments before the panel.

1. James Butler
2. Cheryl Mc Collins
3. Gregory Miller – power point presentation & video
4. Diane Engster, JD
5. Jennifer Msumba – via video
6. Ian Cook
7. Shain Neumeier-powerpoint presentation & video
8. Lauren Emmick
9. Marcos Pucha
10. Aracelis Sanchez
11. Ilana Slaff-Galatan, M.D.
12. Roger and Sharon Wood
13. Louisa Goldberg
14. Michael J Cameron, PhD
15. Arthur-Michele Perazzo
16. Brian Avery
17. Vito Albanese Sr.

Panel Deliberations/FDA Questions:

The FDA posed the following non-voting questions to the panel:

1. In assessing the reasonableness of the risk of illness or injury posed by a device, FDA considers the availability of other treatment options, including pharmacological, behavioral, alternative, and experimental therapies for the treatment of SIB and aggressive behavior.

    a. In general, do you think these other treatments are adequate to address SIB and aggressive behavior?

It was the consensus of the panel that they do not believe that the other treatments were adequate to address SIB and aggressive behavior. This is due to the lack of sufficient data that shows efficacy, especially to evaluate long-term benefit. The panel also noted the challenge in treating a refractory patient population, and due to treatment gaps, treatment therapies are not completely effective in this population.

    b. Is there is a specific subpopulation of patients exhibiting SIB and aggressive behavior for which these options are inadequate?

The panel unanimously concluded that there seems to be a sub-population in which the above treatments are inadequate but that this subpopulation is very difficult to define. The panel recommended that additional research in this area is needed.

2. When determining whether the risk of illness or injury posed by a device is "substantial," FDA will consider whether the risk is important, material, or significant in relation to the device's benefit.

    a. Please discuss whether the available evidence presented at this Panel meeting demonstrates that ESDs that are intended to administer a noxious electrical stimulus for the modification of SIB and aggressive behavior provide a benefit. If so, please identify any specific population(s) of patients for which benefit has been demonstrated.

A slight majority of the panel believed that the evidence was inadequate to show ESDs intended to administer a noxious electrical stimulus for modification of SIB and aggressive behaviors provide a benefit. Panelists considered the student and parent testimonies, anecdotal case histories and reports, and the lack of rigorous ESD studies demonstrating efficacy of such treatment for this refractory population.

    b. FDA has identified the following potential risks related to the use of ESDs that are intended to administer a noxious electrical stimulus for the treatment of SIB and aggressive behavior: other negative emotional reactions or behaviors, burns and other tissue damage, anxiety, acute stress/PTSD, fear and aversion/avoidance, pain/discomfort, depression (and possible suicidality), substitution of other negative behaviors (including aggression), psychosis, and neurological symptoms and injury. Please comment on whether this represents a complete list of risks, whether there any additional risks that

you think should be included, and whether any of the risks listed above are not risks posed by ESDs.

The panel did not feel that the list was complete. In addition, the panel agreed that certain terms listed above may be too vague and should be clarified. Panelists recommended specific additions to the list including: equipment malfunction, long term effects of pain, range of pain, trauma from falls, mistrust of providers, learned helplessness, chronic stress, generalized behavioral suppression, small repetitive damage of other tissues, cognitive impairment, neuropathy, neuropsychiatric symptoms and emotional sequelae. Panelists also discussed the potential for adverse effects that device use may have on staff and their tolerance to administer a noxious electrical stimulus.

3. Section 516 of the FD&C Act (21 U.S.C. § 360f) sets forth the standard for banning devices. Under that provision, FDA is authorized to ban a device if the device presents "an unreasonable and substantial risk of illness or injury" based on all available data and information. Considering the adequacy and availability of alternatives to treat patients exhibiting SIB and aggressive behavior, as well as the benefits ESDs may provide for these patients, please discuss whether ESDs intended to administer a noxious electrical stimulus for the treatment of SIB and aggressive behavior present a substantial and unreasonable risk of illness or injury. In your response please explain your reasoning.

The majority of the panel concluded that ESDs intended to administer a noxious electrical stimulus for the treatment of SIB and aggressive behavior presented a substantial and unreasonable risk of illness or injury. A minority of the panel concluded that either use of the device did not present an unreasonable or substantial risk of illness or injury or there was insufficient information available to reach a conclusion. Some Panelists expressed concern over the currently used devices but proposed a more technologically advanced device might be developed.

4. If FDA determines that a device does present an unreasonable and substantial risk of illness or injury, the Agency next considers whether this risk may be corrected or eliminated by labeling, and may also consider whether imposing other requirements could correct or eliminate this risk. Please identify potential risk mitigations, and discuss how they would address the identified risks.

   Examples of potential risk mitigation include but are not limited to:

   - Restriction on device technology and use (e.g., electrical stimulation output parameters, limitations of number and/or locations of electrode permitted on an individual).
   - Labeling restrictions (e.g., indication only for use in treating only certain populations (e.g., treatment refractory patient populations, patients in certain age groups) or indication for use only when significant (e.g., life-threatening) self-injurious and/or assaultive/aggressive behaviors are being exhibited).

The panel agreed that no risk controls could correct or eliminate the potential risks. However, if labeling changes are made, the panel recommended including administration only by licensed

health professionals, better documentation of patient sequelae, and limiting the use to SIB and aggressive patients who have significant morbidity or life-threatening SIB.

5. If FDA determines that a device presents a substantial and unreasonable risk of illness or injury and proposes to ban it, the Agency must specify whether the ban applies only prospectively or also applies to devices in distribution and/or in use by patients. Please discuss the risks and benefits of applying the ban to devices currently in use by patients, and any recommendations regarding how patients should be transitioned to alternative treatments.

The majority of the panel agreed that if FDA determines that a device presents a substantial and unreasonable risk of illness or injury and proposes to ban it, the Agency must apply the ban to all devices in distribution and/or in use by patients. The panel suggested that an option for transitioning patients to alternative treatments could be to transition to the known FDA approved devices with lesser amperage. The panel suggested that timing should be gradual and allow a transition period of 3-6 months, ideally involving a team of qualified health-care providers. The use of overlapping therapies was also encouraged during the transition period. Some panelists believed that if the behavior escalates for a condition with significant morbidity/mortality there should be an option for compassionate exemption and the patient should be placed back on the device.

6. Should the FDA determine not to ban these devices, the Agency may need to determine whether a clinical study could be conducted. Therefore, please discuss what concerns, if any, you may have about conducting a clinical study with these devices in either children or adults.

The panel recommended that investigators conduct animal studies prior to clinical studies and that clinical studies should begin with adult studies followed by pediatric studies. The panel did express concerns that there may be a lack of clinical investigators willing to conduct such a trial, as well as a lack of patient recruitment, lack of informed consent in this patient population, as it relates to true and informed consent without coercion, and conflict of interest concerns. The panel also addressed concerns related to stimulus parameters associated with the currently used devices and concerns with this population's ability to report adverse events. In addition, the panel recommended that the definitions for the following needs to be fully addressed before moving forward with such a study: quality of life, study outcome, treatment failure, and treatment effect.

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