Effects of Fixed-Time Release (FTR) Fading on Implementation of Physical Restraint

JAMES K. LOUISELLI, Ed.D., ABPP, BCBA

May Institute, Randolph, MA

The present clinical case report describes an intervention procedure to reduce the duration of time spent in physical restraint with a 13-year-old boy who had intellectual disability and serious aggressive behavior. Starting with a 60-seconds fixed-time release (FTR) criterion from physical restraint, the criterion was gradually decreased to 30-seconds, 15-seconds, and 7-seconds. In a final phase, physical restraint was terminated. Duration of physical restraint decreased as the FTR criterion was lowered. Restraint frequency also decreased during the study. After achieving a 7-seconds FTR criterion, physical restraint was eliminated successfully. FTR fading appears to be an effective strategy for reducing the amount of time physical restraint has to be applied. By establishing a low FTR criterion, it may be possible to avoid using physical restraint in favor of alternative intervention procedures. Keywords: challenging behavior, applied behavior analysis, intellectual disability, aggression, autism, physical restraint

Physical restraint is the behavior contingent restriction of voluntary movement by immobilizing one or more extremities with a person in a sitting, standing, or supine position. For many people who have intellectual disability, physical restraint is used to manage emergency situations. However, physical restraint can also be implemented as a planned intervention within a comprehensive behavior support protocol. The therapeutic objective of planned physical restraint is to reduce and ultimately eliminate serious problem behavior such as aggression, self-injury, and property destruction. Though physical restraint can be effective, there are concerns because it can also cause injury, be misapplied, and possibly function as positive reinforcement. Furthermore, many people responsible for implementing physical restraint do not approve of the procedure. Unfortunately, the outcome of unfavorable social acceptance by service providers could be poor intervention integrity.

Despite the concerns about physical restraint, few studies have evaluated reduction and elimination strategies. One macro-level approach adopted by some service organizations has been to establish strict regulatory guidelines for applying, documenting, and reporting physical restraint. This methodology notwithstanding, practitioners have few empirically documented procedures for minimizing and possibly eliminating physical restraint on a clinical level. One example is a study by Luiselli et al. that targeted aggressive behavior by two adolescent boys who had intellectual disability. During a baseline phase, staff at a residential school applied restraint when they judged that aggression had become “unmanageable.” An initial intervention phase required that staff continue to implement physical restraint but according to a behavior-specific criterion. Frequency of aggression and corresponding physical restraint were high during these conditions but were essentially eliminated during a subsequent antecedent intervention phase. Intervention consisted of eliminating and altering several situations that seemed to provoke aggression and the requirement of physical restraint. For one boy the procedures were giving him novel instead of previously mastered tasks, providing him access to more active and less sedentary activities, and having him sit with preferred peers. With the second boy, staff interrupted possible aggression by directing him to sit away from his group when he appeared mildly agitated and allowing him to request a break from scheduled activities.

The procedures evaluated by Luiselli et al. focused on the frequency of problem behavior that resulted in planned implementation of physical restraint. Another strategy examines the duration of physical restraint. Typically, practitioners are advised to maintain physical restraint until the person being restrained demonstrates specific behavior indicating he/she is calm and in control. Thus, a behavior contingent release (BCR) criterion might specify termination of restraint
“after 60 seconds without screaming, struggling, and moving body.” This contingency is advised so that release from restraint negatively reinforces appropriate behavior. However, one difficulty with a BCR criterion is that some people may be unable to rapidly gain control and be sufficiently calm during restraint. As a result, duration of restraint can be lengthy.

An alternative to BCR is terminating physical restraint based on the passage of time independent of behavior. In illustration, Luiselli et al. evaluated a fixed-time release (FTR) criterion from physical restraint with a 12-year-old girl who had intellectual disability and high frequency aggression. Before FTR was introduced, staff at a residential school implemented physical restraint with the girl when she displayed aggression. Physical restraint was one component of a comprehensive behavior support plan featuring positive reinforcement procedures. Using a BCR criterion, staff maintained restraint with the girl until she was calm and non-resistant for 60 seconds. During a subsequent phase, all intervention procedures remained the same except for a FTR criterion that had staff terminate restraint as soon as 60 seconds elapsed. If staff judged that the girl was too highly agitated at the time of release, they were allowed to continue restraint until she was composed for 15 seconds. During the BCR phase, there was an average of 3.2 physical restraints each week and an average duration of 5.6 minutes per restraint. With the FTR criterion, frequency of physical restraint decreased to .67 each week and the average duration per restraint was 3.1 minutes. Staff were able to adhere to the FTR-60 second criterion 55% of the time. Although limited to a single case, the results reported by Luiselli et al. suggested that time spent in physical restraint could be reduced with FTR.

Luiselli et al. also reported positive findings with FTR in a study with three students, ages 11, 14, and 15 years, who had intellectual disability resulting from brain injury. The students attended a specialized school and required physical restraint as a component of their behavior support plans. Staff implemented physical restraint when the students displayed aggression, destruction, and self-injury. During baseline phases of reversal and multiple baseline designs, a BCR criterion was in effect so that each incident of physical restraint was terminated as soon as the students were calm and non-resistant for a specified duration, however long it was to achieve this criterion (BCR with student 1 = .25 minutes, BCR with student 2 = .50 minutes, BCR with student 3 = 2 minutes). Intervention phases consisted of a FTR criterion by which staff stopped restraining the students at the end of 5 minutes (student 1), 3 minutes (student 2), and 2 minutes (student 3) regardless of their behavior at the time of release. These criteria were calculated by taking 60% of the average duration per restraint for each student during the BCR phase. Staff were able to adhere to the FTR criteria with 100% intervention integrity. For student 1, the average duration of restraint per week was 14.2 minutes with BCR and 3.8 minutes with FTR; for student 2, the average duration of restraint per week was 5.1 minutes with BCR and 1.4 minutes with FTR; for student 3, the average duration of restraint per week was 11.2 minutes with BCR and 3 minutes with FTR. The average frequency of physical restraint per week for each student also decreased during FTR.

The studies by Luiselli et al. documented a procedure for reducing the amount of time in physical restraint. Consider that exposure to physical restraint might be lessened further by gradually fading the FTR criterion. For example, a 5-minute FTR criterion could be reduced to 4.5 minutes, then 4 minutes, then 3.5 minutes, and so on, with the objective of reaching the lowest possible duration. If FTR fading continues successfully, it may be possible to eliminate physical restraint entirely in favor of a less invasive intervention.

Given the limited research on FTR, more studies are needed to determine if it is an effective restraint reduction strategy. Also, there are no studies that have evaluated FTR fading or its use as a method to eliminate physical restraint. Accordingly, the present study is the first empirical case report of FTR fading and restraint elimination. Clinically focused, the study addressed serious aggressive behavior displayed by a student with intellectual disability at a specialized school setting.

**Method**

**Participant and Setting**

Mr. A was a 13-year-old boy diagnosed with autistic disorder and PDD-NOS. He did not have verbal speech but communicated primarily through gestures. He had few learning readiness skills and was unable to participate in instructional activities without continuous adult
supervision. He often resisted social interactions, was verbally disruptive, and displayed problem behavior such as aggression and throwing objects.

The setting was a specialized school for students with intellectual disability. All measurement and intervention procedures with Mr. A were implemented in a classroom that contained chairs, desks, and instructional materials. Because of the severity of his aggression and the controlled evaluation that was performed (described below), only he, a therapist, and an observer were present in the classroom each day (approximately 9:30 am to 3:00 pm).

**Measurement**

Target behaviors included the frequency of aggression and the frequency and duration of physical restraint. Aggression was defined as Mr. A slapping, punching, biting, or pulling the hair of the therapist. Eliminating aggressive behavior had been identified as a priority intervention for Mr. A when he was admitted to the specialized school. Aggression interfered with instruction and had caused injuries to staff in the form of scratches and skin abrasions.

*Physical restraint* was the application of an approved protective hold by immobilizing Mr. A's arms against the sides of his body. The therapist restrained him from behind using the minimal force necessary to prevent movement. This method of physical restraint was approved by the school's clinical review committee; Mr. A's parents consented to implementation.

An observer recorded target behaviors throughout the school day. When Mr. A displayed aggression toward the therapist, he/she applied and maintained physical restraint according to a specified fixed-time criterion that was adjusted as the study progressed. The observer recorded each aggregation on a data form and timed and recorded the duration of physical restraint as per the prevailing FTR criterion.

**Procedures**

The study had three intervention phases: Fixed-Time Release, Fixed-Time Release Fading, and No Restraint. With the exception of manipulating the FTR criterion, there were common procedures in each phase. As noted previously, physical restraint was implemented every time Mr. A exhibited aggression toward the therapist. Each day, Mr. A participated in scheduled instructional activities that addressed skill development. All skills had prescribed learning objectives, instructional methods, and contingent consequences. For example, the therapist taught Mr. A using verbal instructions and a “least-to-most” physical prompting hierarchy. When Mr. A responded correctly during instruction, the therapist reinforced his behavior with praise, an edible treat, and access to preferred objects.

Mr. A's daily activity schedule included leaving the classroom to take walks in the school and visit a small play area. The walks occurred when he successfully completed a set number of instructional activities. Like the previously described positive reinforcement procedures, staff who had worked with Mr. A judged taking a walk as a preferred event.

*Fixed-Time Release-60 Seconds.* When physical restraint was applied, the therapist held Mr. A until 60 seconds elapsed. The classroom observer timed each restraint duration and signaled the therapist when to release Mr. A. Upon terminating restraint, the therapist had Mr. A return to the previous activity.

*Fixed-Time Release Fading.* The FTR criterion was decreased gradually from 60-seconds to 30-seconds, 15-seconds, and 7-seconds. Criterion changes were made based on a decreasing trend in restraint frequency and duration within each FTR fading phase.

*No Restraint.* Upon reaching the FTR-7 seconds criterion, the therapist no longer implemented physical restraint. Instead, the therapist moved behind Mr. A as if to restrain him, touched him gently on the shoulder, and told him to “sit down.” When Mr. A complied, the therapist stepped back, waited approximately 5 seconds, and then requested that he “stand up.” Once standing he was returned to the previous activity.

**Results**

Figure 1 shows the frequency and cumulative duration of physical restraint each day. Note that during the No Restraint phase, data reflect the frequency of the “sit down” procedure and the cumulative duration of on-floor time.

In the FTR-60 seconds phase, each restraint lasted 60 seconds so the frequency and cumulative duration data in Figure 1 are identical (i.e., 10 restraints = 10 cumulative minutes). Frequency and duration of physical restraint during this phase decreased steadily before implementing FTR fading. With FTR fading in effect, the cumulative duration of restraint...
decreased each day as the FTR criterion was lowered. Frequency of physical restraint during FTR fading also decreased across the FTR-30 seconds and FTR-15 seconds criteria but increased slightly when the FTR-7 seconds criterion was introduced. Finally, the number of “sit down” procedures in the No Restraint phase increased on the first day but then decreased to near-zero frequency.

**DISCUSSION**

The present study adds to the limited research concerning FTR and physical restraint. The duration of restraint with Mr. A was reduced by gradually lowering the amount of time he was held contingent on aggression. Subsequently, physical restraint was eliminated by changing to a “sit down” procedure. These findings suggest that FTR fading can be an effective restraint reduction and elimination strategy.

As a clinical case evaluation, the study had several limitations. First, physical restraint with Mr. A was introduced without a preceding baseline (no restraint) phase. Because staff were concerned about controlling aggression, physical restraint was started as a behavior management technique to prevent injury. With this in mind, intervention began with a FTR-60 seconds criterion to minimize the duration of restraint. In response to the decreasing trend in restraint frequency and duration during the FTR-60 seconds phase, FTR fading was selected as a method to reduce further Mr. A’s exposure to physical restraint. It is possible, of course, that decreased frequency and duration of restraint might have continued without FTR fading.
Another flaw of the study was the increase in restraint frequency within the FTR-7 seconds phase. One option would have been reinstating the FTR-15 seconds criterion to see if it produced a lower frequency of restraint. Note however that the relatively higher frequency of restraint with FTR-7 seconds was offset by a lower cumulative duration each day.

One other consideration is that the study was conducted under 1:1 conditions in a controlled setting. Mr. A was a high-risk student at the school and as mentioned earlier, had injured staff and could not be managed safely in a typical group classroom. Our treatment objective was to reduce and ideally eliminate aggression while simultaneously having Mr. A participate successfully during instruction. By showing that his aggression could be reduced with physical restraint and then maintained at low frequency without restraining him, he eventually was integrated in a classroom with several other students. Importantly, there were no injuries to Mr. A or staff at any time during the study.

In summary, this is the first study to evaluate the procedure of FTR fading in a person with intellectual disability receiving physical restraint. Given the aforementioned shortcomings and the clinical data that were reported (absence of interobserver agreement assessment), replication and extension of this research is warranted. It appears, however, that FTR and FTR fading can be programmed effectively and in doing so, reduce substantially the duration of physical restraint and possibly eliminate the procedure as a planned intervention.

ACKNOWLEDGMENT: This study was conducted at the May Center for Child Development, Randolph, MA. The author thanks Meredith Garrity and Abby Freidman for their contributions.

REFERENCES

16. Rapoff MA, Altman K, Christopherson ER. Elimination of a retarded blind child’s self-hitting


**CORRESPONDENCE:** James K. Luiselli, Ed.D., ABPP, BCBA, May Institute, 41 Pacella Park Drive, Randolph, MA 02368; tel.: 781-437-1205; fax: 781-440-0401; email: jluiselli@mayinstitute.org.