

Advancing Continence in Typically Developing Children: Adapting the Procedures of Foxx and Azrin for Primary Care

William J. Warzak, PhD, Stacy S. Forcino, PhD, Sela Ann Sanberg, MA, Amy C. Gross, PhD

ABSTRACT: *Objective:* To (1) identify and summarize procedures of Foxx and Azrin's classic toilet training protocol that continue to be used in training typically developing children and (2) adapt recent findings with the original Foxx and Azrin procedures to inform practical suggestions for the rapid toilet training of typically developing children in the primary care setting. *Method:* Literature searches of PsychINFO and MEDLINE databases used the search terms "(toilet* OR potty* AND train*)." Selection criteria were only peer-reviewed experimental articles that evaluated intensive toilet training with typically developing children. Exclusion criteria were (1) nonpeer reviewed research, (2) studies addressing encopresis and/or enuresis, (3) studies excluding typically developing children, and (4) studies evaluating toilet training during infancy. *Results:* In addition to the study of Foxx and Azrin, only 4 publications met the above criteria. Toilet training procedures from each article were reviewed to determine which toilet training methods were similar to components described by Foxx and Azrin. Common training elements include increasing the frequency of learning opportunities through fluid loading and having differential consequences for being dry versus being wet and for voiding in the toilet versus elsewhere. *Conclusion:* There is little research on intensive toilet training of typically developing children. Practice sits and positive reinforcement for voids in the toilet are commonplace, consistent with the Foxx and Azrin protocol, whereas positive practice as a corrective procedure for wetting accidents often is omitted. Fluid loading and differential consequences for being dry versus being wet and for voiding in the toilet also are suggested procedures, consistent with the Foxx and Azrin protocol.

(*J Dev Behav Pediatr* 37:83–87, 2016) **Index terms:** toilet training, child development.

In 1973, Foxx and Azrin¹ demonstrated that toilet training could be accomplished in less than a day.^{2–5} Their participants (n = 34; aged 20–36 mo) were toilet trained within an average of 3.9 hours and remained continent with near-zero occurrence of accidents during a 4-month follow-up. This procedure was pioneered with typically developing children, although its subsequent effectiveness has been demonstrated primarily with individuals with developmental disabilities.^{6,7}

Despite its efficiency and hygienic benefits,⁸ the Foxx and Azrin¹ procedure has not been widely disseminated by physicians. Physicians most commonly recommend a passive, child-directed approach to toilet training, which may take 3–6 months to complete.^{9,10} Perhaps, the time, effort, and expertise required to teach and implement the multiple elements of the Foxx and Azrin¹ approach take more time and resources than teaching

a child-oriented approach. In fact, parents struggle to implement this comprehensive intensive procedure without direct assistance from a trainer.⁴ One study found that only 1 of 5 children was successfully toilet trained after parents read about the procedure, yet 4 of 5 children were trained when parents read about and were supervised on implementation of the procedure.⁴ As such, time-stressed parents may benefit from specific instruction on a brief toileting protocol that uses the most commonly used procedures from the Foxx and Azrin¹ protocol.

Recent investigators have offered brief protocols that eliminate structured sits, fluid loading, and corrective consequences for wetting episodes. For example, Vermandel et al^{11,12} used daytime urine alarms to alert treatment staff to void, who then initiated training procedures. Consistent with Vermandel et al,^{11,12} a survey by physicians⁹ found that only 29% reported recommending intensive toilet training, albeit abbreviated compared to Foxx and Azrin procedure.¹ Thirty-three percent indicated that they would never recommend any form of corrective consequences for wetting episodes, such as having the child assist in cleanup, and only 28% endorsed fluid loading,⁹ mainstays of the Foxx and Azrin¹ procedure. Almost half reported that one of their top 2 recommendations included practice toilet sits and/or rewards for voiding on the toilet, common elements among intensive and child-oriented training approaches.⁹

From the Department of Psychology, Munroe Meyer Institute, University of Nebraska Medical Center, Omaha, NE (S. S. Forcino is now at Department of Psychology, California State University, San Bernardino, San Bernardino, CA. S. A. Sanberg is now at Department of Psychology, Western Michigan University, Kalamazoo, MI. A. C. Gross is now at Department of Pediatrics, University of Minnesota Medical School, Minneapolis, MN).

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Address for reprints: William J. Warzak, PhD, University of Nebraska Medical Center, 985450 Nebraska Medical Center, Omaha, NE 68198-5450; e-mail: wwarzak@unmc.edu.

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A streamlined, user-friendly version of the Foxx and Azrin¹ procedure might benefit families and be feasible within the common pediatric practice wherein typically developing children comprise the majority of patients. Therefore, our objectives were to (1) identify and summarize procedures of Foxx and Azrin¹ classic toilet training protocol that continue to be used in training typically developing children and (2) incorporate recent findings with the original Foxx and Azrin¹ procedures to inform practical suggestions for the rapid toilet training of typically developing children in the primary care setting.

METHOD

Literature Search

Literature searches of PsychINFO and MEDLINE databases used the search terms “(toilet* OR potty* AND train*).” PsychINFO search limiters included Search Mode, Boolean/Phrase; Publication Type, Peer Reviewed Journal; and Age Groups, Childhood (birth–12 yr). To be consistent with PsychINFO, MEDLINE search limiters included Search Mode, Boolean/Phrase; English Language; Human; and Age Related, All Infant: birth–23 months, Child: Preschool, 2–5 years, and Child: 6–12 years. PsychINFO and MEDLINE searches originally yielded 269 and 630 articles, respectively. Additional searches were conducted based on reference lists of reviewed articles. Articles from 1973 to 2014 were included for review. Selection criteria included only peer-reviewed experimental articles that evaluated intensive toilet training with typically developing children. Exclusion criteria were (1) nonpeer reviewed research; (2) studies addressing encopresis and/or enuresis; (3) studies excluding typically developing children; and (4) studies evaluating toilet training during infancy. In addition to the study of Foxx and Azrin,¹ only 4 publications met the above criteria.^{2–5}

Procedures

Two authors (A.C.G. and S.S.F.) reviewed titles, abstracts, and/or full articles to determine whether or not articles met inclusion criteria. The same 2 authors reviewed toilet training procedures from each of the included articles and compared them to procedures outlined by Foxx and Azrin¹ (Table 1). Procedures were rated independently, and discrepancies were discussed until agreed on (i.e., 100% agreement). Some of the original procedures and terms were revised or broken into subcomponents for Table 1. For example, Foxx and Azrin use “negative reinforcement for accidents” within the context of “the trainer reprimanded the child when he wet his pants.¹ (p⁴³⁸)” Technically, this may be “positive punishment” or “positive reinforcement,” but it is not “negative reinforcement” for accidents as that term is currently applied and understood. Similarly, “positive practice” is not typically considered a “positive” reinforcer; rather, positive practice is a response reduction

(i.e., punishment) procedure. Articles were reviewed to determine which toilet training procedures were similar to components described by Foxx and Azrin¹ regardless of label.

RESULTS

Two of the 4 studies^{2,4} used the book adaptation of the original Foxx and Azrin¹ study; therefore, all components of Foxx and Azrin¹ were considered implemented. Both remaining studies^{3,5} reported using nine of the 19 Foxx and Azrin¹ components. Various procedural components in these studies do not necessarily have the same name, but operationally they are the same. For example, using highly preferred and immediate rewards was considered the same as quality and schedule of reinforcement. The 9 components that were implemented in all studies were (1) fluid loading (i.e., encouraging the child to drink fluids throughout training to increase the number of training trials that resulted in a void); (2) positive reinforcement for correct toileting; (3) quality reinforcers; (4) variety of reinforcers; (5) immediacy of reinforcement; (6) frequency of reinforcement; (7) dry pants checks; (8) prompted practice trials; and (9) fading prompts and reinforcers.

Butler² found a significant difference between pretraining and posttraining accidents at 14-day follow-up. Seventy-seven percent of the 49 children self-initiated during training. Ten children were not trained: four did not self-initiate on Day 1 and parents chose to discontinue, and 6 had “severe emotional reactions” to positive practice and discontinued treatment. Nine of 10 children who did not complete training were under 25 months. Average training time was 4.5 hours. Matson and Ollendick⁴ found that following the Azrin and Foxx¹³ book alone resulted in 1 of 5 children being trained; whereas following the book and having an experienced trainer supervise the training resulted in 4 of 5 children being trained. Average training time was 8 hours; however, training was conducted in 4-hour blocks rather than continuously. They also noted emotional side effects related to positive practice and graduated guidance (i.e., restraint) to stay on the toilet. Simon and Thompson⁵ attempted to train 5 children. In addition to using intensive toilet training, the study evaluated the use of different undergarments: diapers, training pants, and underwear. The training methods overall resulted in 3 of 5 children improving continence, with 2 becoming fully trained. Wearing underwear during training improved outcome for two children (i.e., increased continence) but resulted in worse results for 3 children. Halligan and Luyben³ trained 2 children in 4 to 7 hours blocks using intensive toilet training. Underwear was introduced only after a child self-initiated 90% of voids. One child took 5 days to meet the 90% criterion and the other took 7 days.

Table 1. Procedural Components

Foxx and Azrin ¹	Definition	Butler ^{2,a}	Matson and Ollendick ^{4,a}	Simon and Thompson ⁵	Halligan and Luyben ³
Readiness	Compliance check before treatment	X	X		
Distraction-free environment	No competing activities or individuals other than the adult training the child	X	X		
Increased urinations	Fluid loading during treatment	X	X	X	X
Operant reinforcement for correct toileting	Reinforcement for voiding on the potty chair	X	X	X	X
Component skills	Reinforcement for each skill attempted and mastered	X	X		
Quality reinforcers	Highly preferred edibles in conjunction with verbal and physical praise and/or symbolic reinforcers (see symbolic rehearsal)	X	X	X	X
Variety of reinforcers	Provide various reinforcers to decrease likelihood of reinforcers losing effectiveness	X	X	X	X
Immediacy of reinforcement	Immediate detection of voiding (e.g., signally potty) followed by reinforcers	X	X	X	X
Frequency of reinforcement	Initially provides reinforcers for every component skill, correct use of potty, and dry pants at checks	X	X	X	X
Graduated guidance	Verbal instruction followed by as minimal physical guidance needed to complete component skill	X	X		
Verbal instruction	Verbally stating instructions for each skill	X	X		
Imitation	Direct imitation using an anatomically correct doll that could contain and release liquids	X	X		
Dry pants check	Child self-checks to determine whether wet or dry at regular intervals as the main goal is to stay dry	X	X	X	X
Punishment for accidents	Adding or removing stimuli that may decrease the likelihood that the behavior that will occur in the future is currently understood as <i>positive</i> or <i>negative punishment</i> , but Foxx and Azrin ¹ called this negative reinforcement	X	X		
Prompted practice trials	Instruct the child to sit on the toilet at regular intervals	X	X	X	X
Positive practice	Overcorrection, a (positive) punishment procedure, as described in the current behavioral literature	X	X		
Verbal and symbolic rehearsal	Verbal praise by means of social contingencies (e.g., "Dad will be so happy for you!")	X	X		
Fading prompts and reinforcers	Omit prompts and reinforcers for component skills once demonstrated, then gradually omit for toileting and dry pants, respectively, as they are demonstrated regularly	X	X	X	X
Posttraining attention	Maintenance of the toileting protocol without prompts for toileting	X	X		

^aDenotes the use of Azrin and Foxx¹³ methods; therefore, all components of Foxx and Azrin¹ methods are presumed implemented.

DISCUSSION

Foxx and Azrin¹ were the first to provide an empirically validated multicomponent treatment package for toilet training. Although this procedure was pioneered with typically developing children, there is a paucity of subsequent empirical literature with that population. Of the 4 studies found, 2 used the Foxx and Azrin¹ intensive toilet-training method^{2,4} and the other 2^{3,5} used some but not all components of the procedure. Table 2 provides key elements of the original Foxx and Azrin¹

procedure used in all 4 studies. Common training elements include increasing learning opportunities through practice sits and fluid loading, and having differential consequences for being dry versus being wet and for voiding in the toilet versus elsewhere.

Almost 50% of respondents to a previous physician survey⁹ reported that practice sits and positive reinforcement for voids in the toilet were among the primary toilet training recommendations they provide to parents, suggesting these are acceptable procedures. Approximately one-third

Table 2. Adapted Foxx and Azrin¹ Procedure for Toilet Training in Primary Care

Procedure ^a	Procedure Implementation
Fluid loading	Use a variety of preferred drinks. Offer drinks every few minutes, and pair drink consumption with verbal approval. Overcome initial reluctance to drink with the use of salty snacks and modeling if needed.
Dry pants check	Ask the child whether pants are wet or dry approximately every 15 min and before toilet sits. Have the child feel the area and do an inspection. Give praise and a preferred snack and/or drink for having dry pants. If pants are wet, say, "You have wet pants" and proceed with change of pants with limited social interaction. Repeat until independent initiation occurs, then slowly fade.
Prompted practice trials	Give a verbal prompt every 30 min to sit on the toilet. Start with a verbal prompt and use physical guidance as necessary. Withdraw physical guidance as child responds to verbal prompt alone. Fade as independent initiation begins.
Reinforcers/rewards	Use rewards that are of high importance to the child (e.g., verbal praise, hugs, kisses, high 5's, stickers, special snacks, and activities). Use a wide variety of such rewards immediately for sitting and immediately after voiding in the toilet. Provide different levels of reward for dry pants, compliance with practice trials, and voiding on the toilet. Voiding on toilet should result in the most preferred reward.
Response to wet or soiled pants	Provide a calm noninteractive response when voiding occurs outside the toilet. For example, "You are wet. We need to cleanup." Limit social interaction. Have child assist with cleanup (e.g., take pants down, put in laundry). After cleanup, briefly remind child to keep pants dry and void in toilet.
Fading prompts and reinforcers/rewards	Once independent initiation occurs, fade dry pants checks and prompts to sit on the toilet. Fade reinforcers/rewards by giving fewer tangible rewards (e.g., snacks) and continue to give praise or other social approval.

^aAssumes "training pants," not diapers.

of providers reported that they would never recommend a corrective consequence for wetting accidents, and given the time-limited nature of a pediatric appointment, it would be challenging to adequately teach positive practice, regardless of its merits. These issues, combined with emotional reactions to positive practice reported in previous research,^{2,4,14} led to the more tempered suggestion regarding response to accidents (i.e., remain neutral and provide little interaction during cleanup). Nevertheless, it is important for providers to teach parents an appropriate response to wetting episodes, so the difference in consequences between being wet and being dry is clear to the child, thereby facilitating learning.

Toilet training procedures are many and varied, and there are successful brief procedures,^{11,12} which diverge significantly from Foxx and Azrin.¹ We have focused on identifying those classic Foxx and Azrin procedures offered in 1973¹ (Table 1) that continue in use to this day and have adapted them based on the literature, which includes but is not limited to parent and provider feedback. Our modified suggestions (Table 2) address the needs of typically developing children, previously identified as free of urinary tract abnormalities, recurrent urinary tract infections, or other significant lower urinary tract dysfunction. Toilet training presumes children have prerequisite skills (e.g., can lower and raise pants independently, can sit independently on the toilet, etc.), not the least of which is being compliant with parental instructions.⁹ The current suggestions provide an efficient and simplified approach to intensive toilet training

that is likely to result in briefer time to train than a passive child-directed approach. Nevertheless, some children do not achieve rapid success with these methods; for these children, we recommend suspending training for 3 to 6 months to allow for further child development and readiness. If developmentally ready, physicians may also suggest another training method that has empirical support (i.e., the use of urine alarms within the context of daytime toilet training^{11,12}) or refer to a behavioral specialist for more individualized intervention. Future research might evaluate the individual components of the Foxx and Azrin¹ procedure, which have not been empirically analyzed in isolation, to determine their relative contribution to toilet training effectiveness and their social acceptability.

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