

THE LONG-TERM EFFECTS OF A TOILET TRAINING PROGRAM FOR PEOPLE WITH INTELLECTUAL DISABILITIES

A PILOT STUDY

S. Bettison, D. Davison, P. Taylor and B. Fox

Summary

This study aimed to replicate the intensive behaviour modification techniques designed by Azrin and Foxx to toilet train institutionalized people with severe and profound intellectual disability. Long-term effects, after intervention had ceased, were assessed. Subjects/trainees (Ts) ranged from 7 to 50 years of age. The results revealed markedly reduced accident rates and some independent toileting for five of the eight subjects. However, although most trainees improved, none achieved full accident-free independence. Problems of subject selection, training techniques and long-term maintenance of skills are discussed.

Lack of independent toileting is one of the most pressing problems in institutions housing people with profound and severe intellectual disabilities. It impedes independent functioning and, above all other restrictions, bars residents from taking part in many activities both for education and enjoyment. Considerable effort is spent by staff in cleaning and toileting which can lower staff morale, and which also takes time and energy away from training, education and general stimulation. The resulting limitation of experience retards residents even further in relation to their normal peers, as well as intensifying their abnormality in the eyes of others.

Toileting is a complex chain of operant responses and fine discriminations, which involves a great deal more than voluntary sphincter control. Discriminations are required with regard to environmental arrangements, clothing and its disposition on the body, and physiological sensations. In addition there is a long chain of movements which must follow a fixed order.

The traditional methods employed by parents and institutions to toilet train both non-disabled and intellectually disabled people have not been directed at the whole chain. Training usually involves frequent toileting, praise for voiding in the toilet and occasional unsystematic mild punishment for accidents. The responses and discriminations in the chain are usually acquired in a similarly unsystematic manner, although the results are usually satisfactory for most children. However, people with intellectual disabilities frequently have discrimination deficiencies and learning disabilities which prevent them from learning this and many other complex chains in the traditional learning environments.

Systematizing learning on the basis of operant principles gives some evidence of overcoming many of these problems. Toileting has joined many other skills which have been made possible for people with intellectual disabilities under more controlled conditions. The first report of operant principles applied to toilet training was published in 1962 (Blackwood, 1962). Since

then, at least 20 further studies have been published, together with review papers (Rentfrow & Rentfrow, 1969; Watson, 1967). In general, methods recommended over the last decade have progressed from a very simple system of positive reinforcement for voiding in the toilet at regular intervals, to a complex combination of procedures aimed at establishing the entire chain in the later studies. Usually subjects have been trained in groups (a practical necessity in most institutions). Primary care staff have carried out the training under psychological supervision, after receiving some (usually unspecified) training in operant principles.

The simple reinforcement procedures resulted in little more than a reduction in accidents and an increased number of voidings "caught" in the toilet. Even this amount of learning took a number of months to achieve (Colwell, 1969; Dayan, 1964; Hundziak et al., 1965; Kimbrell et al., 1967; Levine & Elliott, 1970; Spencer et al., 1968; Thompson & Grabowski, 1972; Yoder, 1966). Nevertheless, such modest results cannot be dismissed if the concurrent reductions in laundry and infections, the subsequent provision of further learning experiences for the trainees, and the rise in staff morale reported by some authors are taken into account.

Other studies, particularly more recent ones, report more complex behavioural analysis and operant procedures with faster learning and the achievement of greater independence in toileting (Azrin, 1973; Azrin, Bugle & O'Brien, 1971; Azrin & Foxx, 1971 and 1973; Bensberg et al., 1965; Giles & Wolf, 1966; Van Wagenen et al., 1969a and 1969b; Mahoney et al., 1971). Indeed, Azrin and his co-workers report an average learning time of four days to criterion with an additional follow-up procedure for several weeks resulting in the establishment of fully independent toileting. Despite these encouraging results most toilet training studies repeat the inadequacies inherent in clinical research. This paper particularly concentrates on the lack of evidence for long term effects after the training procedures have been withdrawn. Only four studies provide any evidence of long term effects. Baumeister & Klosowski (1965) found that their subjects reverted to their pretraining toileting level once the controlled environment was withdrawn. Dayan (1964) and Yoder (1966) report changes which were stable over 11 months. However, both these authors kept the same staff and environmental conditions over the follow-up period, so that it is possible that the training contingencies were maintained. Of the studies using the more complex procedures only Van Wagenen et al. (1969) have given follow-up data, over a 1 to 6 month period. All 9 of their subjects maintained their improvement in a family setting with some minor increases in accidents.

This study aims to replicate the more complex procedures developed by Azrin & Foxx (1973), and to provide information about long term effects. It is a pilot study for a much larger study in progress, and additionally provided the experimenters with practical experience with the training procedures before the main experimental program began.

Subjects

Basic data for the 8 trainees in the study are shown in Table 1.

Table 1. Trainees for toilet training

Trainees	sex	Age in yrs.	Level of delay	Approx. period In institution	Clinical diagnosis and special characteristics	Medication
1	M	50	severe	45 years	Unknown cause. Has had tuberculosis. Hydrocele (removed since training). Placid.	Diazepam
2	F	49	severe	30 years	Unknown cause. Evidence of lower motor neurone lesions and a number of minor strokes suspected. Resistant. Tears clothing.	Thioridazine, valium, haloperidol, benzotropine
3	M	18	profound	9 years	Unknown cause. Colostomy. Metabolic disorder (episodes of severe iron deficiency). History of biting and scratching.	Haloperidol, benzotropine
4	M	19	profound	12 years	Down's syndrome. Extremely passive and withdrawn.	Nil
5	M	7	moderate	3 years	Down's syndrome. Ventricular septal defect.	Nil
6	M	20	profound	3 years	Unknown cause. Thyroid hyposecretion suspected. History of extreme obesity.	Thyroxine, thioridazine
7	F	13	severe	13 years	Post cerebral venous thrombosis at 9 months. Epileptic. Quadraplegic cerebral palsy. Mildly abnormal EEG.	Pheytoin, phenobarbitone
8	M	12	severe	6 years	Birth trauma (anoxia). Believed to be epileptic. Gross generalised abnormal EEG. Physically uncoordinated.	Nil

Procedures

Setting

Strathmont Centre opened in 1970 with over 600 beds. Its environment is village-like, with villas of 32 residents divided into units of 8. One or two primary care staff are with each unit of 8 and most residents go to school, work or other activity during the day. The primary care staff consist of 3-year trained mental deficiency nurses, student nurses and untrained home assistants selected for maturity and experience with children.

Four trainers, including the senior author and a Charge Nurse, were gradually introduced to the program. T1 was trained by the senior author in his living area, but away from other residents, while all other people were trained in a unit made available especially for the program, by 2 to 4 trainers who rotated their involvement in the training during each day. T1, T2 and T3 were trained alone, while T4 to T8 were trained in groups of two or four. All Ts spent 7 to 8 hours each week day during training in a large airconditioned bathroom and toilet area.

Staff training and organization

This is an aspect of clinical programs which is rarely described but which could have a considerable effect on results. All trainers were volunteers from the Centre staff. The organization was hierarchical, with the senior author responsible for the overall planning, staff training and liaison, and with the Charge Nurse responsible for supplies, day to day attendance of trainees and supervision of the staff rostering. The Staff Nurse took responsibility for maintenance of equipment and preparation of the training area, while the Home-Assistant was

responsible for cleaning. All trainers took a regular part in the training.

The Charge Nurse had considerable experience with a variety of operant programs prior to this study, but an intensive 3-day staff-training program was provided for the other two staff. This followed the Azrin & Foxx manual (1973) and included lectures, discussion, quizzes and video-tape. During this period an informal, enthusiastic and friendly atmosphere was established. The supervising trainer worked alongside staff for a large part of each day so that problems were dealt with immediately and support was constantly available.

Toilet training procedures

These followed Azrin & Foxx (1973) and will be briefly outlined here. General training conditions involved Trainees sitting close to the toilet area and away from other staff and residents, although there was considerable interaction with trainers. Trainees were dressed in tops and specially provided underpants with a battery operated alarm attached to the back. This sounded when the terminals in the crotch were bridged by urine or faeces. The toilets were fitted with a bowl with a similar alarm emitting a different tone from the pants alarm (see Azrin & Foxx, 1971). The training was provided for approximately 20 days and consisted of 3 stages as follows:

Bladder and bowel training: During this period each trainee experienced a half-hour schedule of training. A variety of drinks were first offered until T had drunk as much as wanted up to 4 cups. One minute later s/he was prompted to go to the toilet with a touch, a gesture and a simple verbal direction. Each step of toileting was prompted in this way with plenty of time allowed for the trainee to respond voluntarily. When necessary T's hands and body were gently guided until s/he began to move independently when enthusiastic praise was given. As movements were initiated with no guidance, the prompts were gradually made less and less active. Trainees sat on the toilet until elimination occurred (indicated by the toilet alarm) or for a maximum of 20 minutes. A large food reward was given with enthusiastic physical and verbal praise for elimination. The same procedures of prompting and guidance were used to elicit return from the toilet and toilet flushing. Thereafter T was rewarded every 5 minutes for dry pants with a small food reward and praise until the next half-hour schedule was due. Eliminations in the pants (indicated by the pants alarm) resulted in an over-correction procedure consisting of admonition, withdrawal of food and drink, the T wiping up the mess and practice trials of the toileting sequence until the next half-hour schedule was due.

Self-initiation training: After the first time the trainee independently went through the toileting procedure and successfully eliminated in the toilet, the half-hour schedule ceased. Drinks were then offered after toilet use and T was never prompted again to go to the toilet. After each successive self-initiation, T's chair was moved about 60 cm further away from the toilet, rewards for dry pants occurred less frequently, and drinks and rewards for toilet use became more and more intermittent. Activation of the pants alarm resulted in admonition, withdrawal of food and drinks, mopping up for 15 minutes, then six practice trials of the toileting procedure. Three consecutive toilet accidents or a full training day with no elimination resulted in a return to bladder and bowel training.

Maintenance: After at least 9 out of 10 successive eliminations were self-initiated in the toilet, the trainee was returned to his/her normal environment without the alarms, and primary care staff carried out a generalization program under the supervision of the training staff. Rewards for toileting had been completely phased out by this time. Rewards for dry pants were scheduled before meals, snacks and bedtime with others given unsystematically. Staff continued recording each reward and all toilet accidents, which were treated as they had been during self-initiation training. The next meal, snack or bedtime was then delayed for an hour. This procedure continued until the trainee went for 14 days with no accident or 6 months,

which ever was the shortest, when staff were congratulated and thanked formally, asked to refrain from interfering with T's toileting and all intervention was withdrawn. The maintenance program was not undertaken unless T reached the required criterion.

Follow-up procedures

Training staff spent 9 hours a day for three days in each S's environment observing all elimination behaviour. The trainee was checked covertly for dry pants at least every hour and all accidents were recorded. In addition observations of all toilettings were recorded using the following check list. These observations were made by training staff 8 to 11 months after intervention had been withdrawn.

1. Went to toilet

Time
Went with no direction
Followed other residents
Sent by staff
Taken by staff
Other (explain)

2. Pulled pants down

Completely by self
Not clear of toilet seat
By self with help
Between knees and ankles
Taken right off
Not pulled down at all
Pulled down by staff
Other(explain)

3. Sat on toilet

Sat by Self
Sat, but not fully on seat
Prompted to sit
Put on by staff
Other (explain)

4. Elimination directed in toilet

All went in
Some splash or faeces on seat
Much of elimination on seat or outside toilet
Did not eliminate
Other(explain)

5. Stood after eliminating

Had completely finished
Still dripping
Still a full stream
Prompted to stand
Physically helped by staff
Stayed on seat for 20 minutes or more
Other (explain)

6. Pulled pants up

Neatly by self
Underpants completely up but not outer garments
Neither pants or outer garments completely up
Pulled up-prompted
Pulled up by staff
Other (explain)

7. Flushed toilet after use

Pushed button fully by self
Pushed button-partial flushing
Touched or moved towards button
Prompted by staff
Button pushed by staff
No attempt to flush
Other (explain)

8. Unacceptable behaviour

Put hand in toilet
Flapped lid or seat up or down
Head in toilet
Sucked hand after putting it in toilet
Smeared with soiled hand
Other(explain)

At random intervals a second observer, unacquainted with the status of trainees, independently took records to check on the reliability of the follow-up observations.

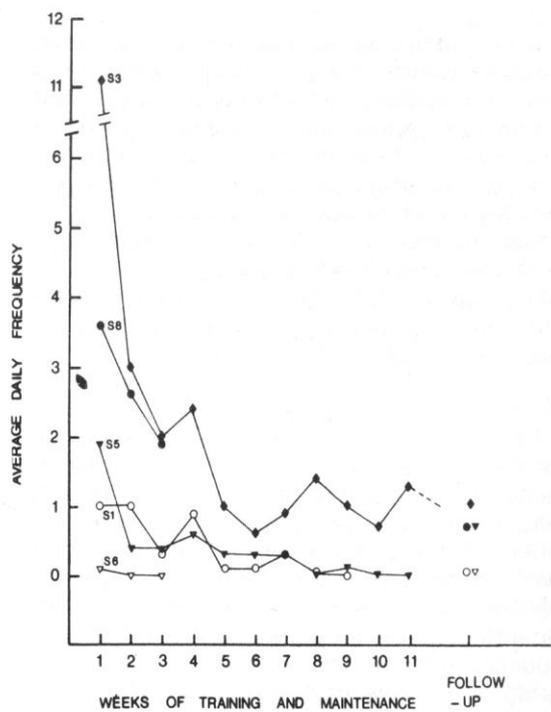


Fig 1. The frequency of toileting accidents per day, averaged over each training and maintenance week for 5 subjects in whom intensive training produced increases in toileting skills as measured 8 to 11 months after training. (The frequency of toileting accidents during follow-up is averaged over three days.)

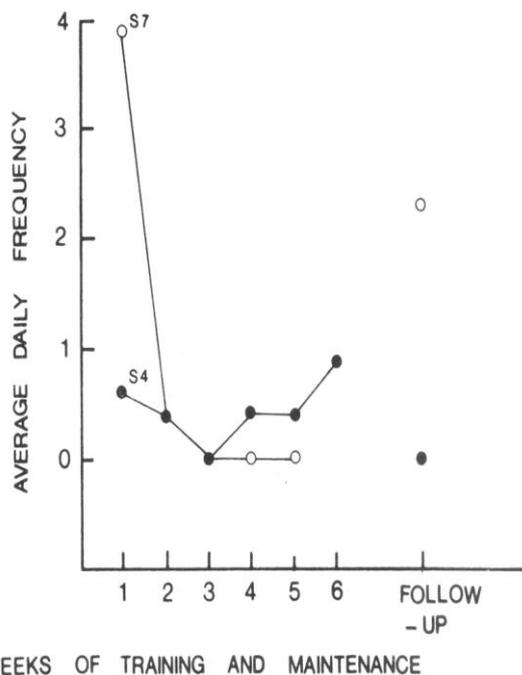


Fig 2. The frequency of toileting accidents per day averaged over each training and maintenance week for 2 subjects in whom intensive training produced little increase in toileting skills as measured 8 to 11 months after training. (The frequency of toileting accidents during follow-up is averaged over three days.)

Results

T2 will not be included in the discussion of results as her training was discontinued after five days. She was markedly resistant to the program and proved too difficult for the trainers to manage.

Performance during training

Performance during training was similar to that reported by Azrin & Foxx (1971) except for two trainees (T4 and T8), who did not achieve the training criterion within the allotted time. T4 continued training for a further 21 days, but no apparent increase in toileting skills was evident during that time. The five remaining Ts all reached the training criterion and progressed to the maintenance stage. Only T3 did not reach the maintenance criterion (see Figures 1 and 2).

Follow-up results

These are summarised in Table 2.

Toilet accident rates: All trainees had accidents before training and, with one exception, these occurred a number of times a day. At follow-up, three trainees (T1, T4 and T6) had no accidents, although one of these (T4) only "held" until he was taken to the toilet, having not achieved self-initiated toileting at the end of 7-weeks training. He was also the trainee with few accidents before training. Three trainees (T3, T5 and T8) had only occasional accidents at follow-up. T3 had not achieved the maintenance criterion after 6 months although his was the greatest reduction in accidents. T8 had not reached the training criterion in the allotted time although his accident reduction at follow-up was similar to that of trainees who had completed training. The remaining trainee was quickly successful during training and maintenance, but at follow-up had reverted to the pre-training level (T7). It appears that completion of training and maintenance to criterion is not always predictive of a marked long-term effect on accident rates.

Table 2. Comparison of toileting levels before training and 9-11 months after training

Subject	Toileting before training	Toilet training days	No.of returns to bladder training	Total maintenance days	Toileting at follow-up
1	No attempt to toilet self. Often wet, never dirty. Occasional toilet use when taken.	11	1	45	Toilets self 3 or more times a day. Rarely wet or dirty. Occasional toilet use on the infrequent times staff sent him.
2	No attempt to toilet self. Frequently wet and dirty. Smearred faeces. Rare toilet use when taken.	5	-	Nil (training discontinued)	Not assessed.
3	No attempt to toilet self. Often wet. Will cooperate when taken, but toilet use only reported twice in several years (colostomy).	16	2	171 (Discontinued without reaching criterion)	Toilets self 4 or more times a day, but often without elimination. Wets once every few days or weeks. Often sent to the toilet, when he often eliminates.
4	No attempt to toilet self. Rarely wet or dirty. Often uses toilet when taken.	39	4	Nil (training discontinued)	No attempt to toilet self. Never wet or dirty. Usually eliminates when sent. (Habit trained).
5	No attempt to toilet self. Frequently wet. Sometimes dirty. Occasional toilet use when taken.	6	Nil	70	Toilets self 3 or more times a day, occasionally without elimination. Wet once every day or two. Sometimes eliminates on the frequent times he is sent.
6	No attempt to toilet self. Frequently wet or dirty. Occasional toilet use when taken.	3	Nil	14	Toilets self 6 or more times a day, but often to masturbate only. Never wet or dirty. Toilet use on rare times he is sent.
7	No attempt to toilet self. Frequently wet or dirty. Rare toilet use when taken. Will not sit willingly.	5	1	21	Toilets self 2 to 3 times a day, but rarely eliminates. Wet or dirty twice or more a day. Occasional toilet use when sent. Sits willingly.
8	No attempt to toilet self. Frequently wet or dirty. Some toilet use when sent. Occasional faeces or urine smearing.	20	1	Nil (training discontinued)	Toilets self up to 5 or 6 times a day and usually eliminates. Wet or dirty once every few days or weeks. Sometimes eliminates when sent.

Self-initiated toileting: This is the most difficult result to assess because of the widespread practice among primary-care staff to send to the toilet and direct even residents who are competent to take themselves and have no accidents. Nevertheless, the follow-up investigation clearly indicated that six trainees frequently toileted themselves; however, one of these (T3) was only partly self-toileting as he was sent frequently by staff and sometimes took himself with no resulting elimination. The remaining trainee (T7) often took herself through the toileting procedure with only rare eliminations. No trainees toileted themselves before training.

Dealing with clothing: All but T4 attempted to pull pants down and up during toileting with varying degrees of success. To be successful the pants had to be clear of the toilet seat and near the knees when down. Both under- and outer-garments had to be replaced to near the waist when up although tucking-in was not expected. During the follow-up period, T1 always successfully pulled his pants down, while other trainees were at least 50% successful. T1, T3 and T7 were less often successful at pulling their pants up, whereas T5, T6 and T8, were no worse at pulling pants up than down.

Sitting on toilet: Many residents with intellectual disabilities in institutions do not place themselves on the toilet in such a way that all the elimination is contained. Only two trainees (T5 and T8) had problems seating themselves during follow-up: Both were small boys who appeared to have trouble balancing at the right angle to direct urine into the toilet, although T5 often used a pot and had no problems with it. T3 very occasionally misdirected urine. Otherwise all trainees sat themselves on the toilet appropriately.

Standing after elimination: Some residents with intellectual disabilities in institutions often stand up from the toilet taking no account of whether elimination has finished. Others sit for long periods until taken off the toilet. Five trainees in this study rose appropriately after finishing eliminating. T4 (habit trained) made no attempt to stand himself, and T8 was often helped to stand after remaining seated for a long period. Staff indicated that T8 only did this during follow-up observations, and not during normal villa life immediately before and after that period.

Flushing the toilet: This was the task with which trainees had least success. Only one (T5) flushed the toilet and this only four times during the follow-up period.

Inappropriate behaviour: Only three instances of such behaviour were observed at follow-up. T4 rocked while seated, a behaviour he exhibited frequently in all settings. T6 and T7 both put a hand in the toilet once. There was no sign of unwillingness to sit by T7 or smearing by T8, both problems before training.

The independent observer attended five times for several hours during the follow-up observations. Observer reliability for observations of dry and wet pants was 100%, and for the items on the check list of toileting performance 71.5%. Disagreements were on items such as whether the subject eliminated and pulled pants up successfully. These were occasionally difficult to judge without interfering with the subject.

Discussion

The results indicate that intensive toilet training is effective for at least some people with intellectual disabilities in institutions. They are especially encouraging when the few days of training and the several weeks or months of generalization procedures are compared with the years of conscientious toilet training which all trainees had experienced previously.

However, a number of factors need to be considered carefully by anyone intending to implement this program. Individual trainees showed marked variability in their reactions to the program. T2 proved so resistive that her training could not be continued. Her method of resistance was to tear her pants, smear faeces and force urination at frequent intervals. This pattern might be detected by careful observation before-hand, but often would be discovered only during a trial program, since intensive teaching and interaction was rare in the usual ward setting. Azin and Foxx (1973) also indicated that the program had limitations with such subjects.

Further experience may define other groups of residents who cannot benefit from this program. For example, T4, besides having profound intellectual disabilities, was extremely withdrawn and

passive. He achieved very little except a slightly increased ability to hold urine. It may also be that many residents with clear evidence of nervous system damage like T7 may be unable to maintain the control needed for successful self-toileting. However, T8, also with evidence of damage, complicates the picture. He achieved very little during training, but performed with considerable success 8 months later.

Other trainees posed a variety of problems. T3 had undergone a number of programs prior to toilet training. These considerably modified constant scratching and biting, extended his attention span and gave him some simple manipulation and locomotor skills. However, during the first few days of training, he responded to the overcorrection-procedure with scratching, biting, self-hitting and crying, although this disappeared completely by the end of training and he initiated much more positive interaction with staff. Both of these changes have been maintained over 8 months. He also frequently confused the sequence of responses during training and still showed this tendency during follow-up. It is possible that a number of residents may have similar problems and cannot be expected to achieve fully self-initiated toileting with these procedures. However, T3 achieved the greatest decrease in accidents and this can be of considerable benefit to himself and staff.

Nearly all trainees showed some signs of resisting direction during the first few days of training. For instance, T1 vomitted a number of times during training and his fluid intake was reduced. He showed other signs of passively resisting the program and this may have been one of them.

There are a number of aspects of the program which require further research. Stimulus control of a number of the responses was inadequate. Nevertheless, the alarms did appear to act as effective bridging cues in establishing control of elimination in the toilet and the avoidance of accidents. Similar alarm systems have been reported by Van Wagenen et al. (1969a and 1969b) and Watson (1968). There was no similar stimulus control of pulling pants up and down or flushing the toilet. This is clearly indicated by the number of subjects who failed to deal adequately with clothing and flushing during follow-up.

The Azrin and Foxx program did not arrange the treatment of responses as a complete chain. All tasks were taught together. Further, pulling pants up and flushing occur after the major reinforcer which is presented for toilet use. Further research may show that a full backwards-chaining procedure could overcome this problem. It may also overcome the problems experienced with the self-initiation stage of training. Four trainees could not maintain their response once they reached this stage and had to be taken back to bladder and bowel training at least once. They either began to have frequent accidents or refrained from eliminating at all for a day or more during training sessions. It is also possible that the fading of reinforcement occurred too quickly during the self-initiation stage.

Some of the loss of toileting skills observed during follow-up observations as compared with post training observations may have resulted from the general staff practice of assisting residents with many self-help tasks. It is an understandable practice when staff are responsible for the cleanliness and well-being of a number of residents as well as general housekeeping. This may be rectified only by a much greater emphasis in institutional staff training courses on the need for encouraging independence in people with intellectual disabilities.

Summary

Azrin and Foxx do not provide evidence of long-term effects of their program, although in the preface to their manual they report that the procedure was "used to train self-initiated toileting to over 1000 retardates and non-retardates in over 50 different institutions" (p.xi, Azrin & Foxx, 1973). This study provides long term evidence that for subjects in one institution the results are

promising when compared with the lack of progress made by these subjects over years of non-specialized training.

There are a number of aspects requiring further investigation, including choice of trainees, stimulus control of responses, and arrangements of the response chain. Despite the problems, it appears worthwhile for institutions to consider establishing a small group of expert staff who are able to further refine procedures and act as trainers and consultants to other staff in this and other special training areas.

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