Covert Video Monitoring in the Assessment of Medically Unexplained Symptoms in Children

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Objective Diagnosis of medically unexplained symptoms (MUS) occurs after thorough evaluations have failed to identify a physiological cause for symptoms. However, families and providers may wonder if something has been missed, leading to reduced confidence in behavioral treatment. Confidence may be improved through the use of technology such as covert video monitoring to better assess functioning across settings. Methods A 12-year-old male presented with progressive neurological decline, precipitated by chronic pain. After thorough evaluation and the failure of standard treatments (medical, rehabilitative, and psychological) covert video monitoring revealed that the patient demonstrated greater abilities when alone in his room. Negative reinforcement was used to initiate recovery, accompanied by positive reinforcement and a rehabilitative approach. Covert video monitoring assisted in three subsequent cases over the following 3 years. Results and Conclusions In certain complex cases, video monitoring can inform the assessment and treatment of MUS. Discussion includes ethical and practical considerations.

Key words case study; chronic and recurrent pain; ethical issues; rehabilitation.

Introduction Medically unexplained symptoms (MUS) are physical symptoms that suggest an underlying medical condition, yet no medical cause has been identified, or the symptoms are greater than expected for the medical diagnosis. The term MUS is thought to imply a less dichotomous relationship between physical and psychological contributions than terms such as “functional” or “psychosomatic” (Eminson, 2007), recognizing that there are multiple contributors or causes of any physical symptom. MUS in children and adolescents range from common, relatively minor aches and pains to rare, disabling conditions which may include multiple somatic complaints, loss of function, and apparent inability to perform basic activities such as eating, talking, walking, or self-care (Eminson, 2007; Kołowska et al., 2007; Lask, 2004).

Assessment of suspected MUS requires a thorough medical evaluation. This is a crucial component, as the consequences of misdiagnosing certain medical problems can be dire (Spratt & Thomas, 2008). Further, families are unlikely to accept a biopsychosocial formulation of the symptoms if they feel that they have not received appropriate medical attention and evaluation. The assessment should also consider potentially explanatory psychosocial stressors and attend to inconsistent or medically improbable symptoms (Campo & Fritz, 2001). Failing to recognize MUS and not treating the factors maintaining the illness behavior can also have unfortunate consequences, including unnecessary medical evaluations and procedures, and possible harm from such procedures including amputation, permanent disability, or disfigurement (Libow, 2000).

When the results of careful assessment suggest MUS, initial treatment should consist of building rapport, acknowledging to patient and family the potential for...
The presentation of symptoms is thought to indicate MUS (e.g., Oberfield, Reuben, & Burkes, 1984). However, this is an invasive assessment and does not have clear evidence for its reliability in the evaluation of MUS. In general, there are few options for being fully confident in a diagnosis of MUS, and it is often made as a diagnosis of exclusion. Due to this ambiguity, providers and families may be left with reservations about the true explanation for symptoms, and may hesitate when applying effective treatment or continue to seek additional medical evaluation in pursuit of a more concrete explanation.

We present a patient with severe MUS precipitated by chronic pain that evolved into an alarming progressive decline in all aspects of functioning. After a thorough medical and psychological evaluation and the failure of standard treatments (medical, rehabilitative, behavioral, and psychological), the treating team utilized covert video monitoring to determine if the patient demonstrated different abilities when alone. This video assessment provided objective data that informed intervention and led to resolution of the symptoms.

Case Report

Dan was a 12-year-old male who, over approximately 15 months, had developed severe pain in his ear, throat, and stomach, a habit cough, and a progressive decline in motor functioning to the point where he was unable to eat, dress, bathe, or walk independently.

Developmental and Medical History

Dan was reportedly healthy until age 11 years when he developed ear pain which remained after resolution of an ear infection. This pain generalized to both ears and continued even after oral antibiotics, intravenous antibiotics, and several pain medications. Due to allodynia and changes in temperature and color of the ears, he was diagnosed with complex regional pain syndrome. Five months following his ear infection, Dan began to experience minor loss of sensation and function in his legs. Approximately eight months after initial onset of ear pain, Dan developed and was treated for strep throat, but throat pain also remained after treatment. At this point, he developed a habit cough which was severe enough to interfere with activities of daily living. Due to throat pain, he had difficulty eating and began losing weight. Two months later, he developed stomach pain and began walking with a cane. One year after initial onset of pain, Dan’s lower extremity weakness had progressed until he was in a wheelchair. He gradually lost the ability to sit or even hold his head up and was dependent on others for assistance with all aspects of functioning including mobility, eating, showing, and even toileting. He had lost 40 pounds which precipitated a nasogastric tube for alimentation. Around this time, he completed a formal cognitive assessment. Results indicated intellectual functioning in the borderline range, which was described as an underestimate as pain and anxiety appeared to decrease his performance. He had below average spelling and math performance, average reading skills, below average adaptive functioning, and significant anxiety and somatic symptoms.
Throughout his symptom course, Dan had numerous specialized physical examinations by rheumatologists, ear, nose, and throat specialists, pain specialists, and neurologists. All evaluations including blood work and MRI of the brain and entire spine were normal. During this time, he had numerous medication trials for pain and other symptoms including NSAIDs (ibuprofen); analgesics (acetaminophen); narcotic analgesics (oxycodone, methadone, and codeine); tricyclic antidepressants (amitriptyline); anxiolytics (clonazepam, buspirone); anticonvulsants (gabapentin, pregabalin); neuroleptics (quetiapine); alpha-agonists (clonidine); and proton pump inhibitors (omeprazole). Prior to treatment in our program, he had participated in physical therapy, intensive physical rehabilitation, cognitive–behavioral therapy, biofeedback, acupuncture, craniosacral therapy, homeopathic medicine, and energy medicine. None of these medications or interventions reduced Dan’s pain or improved his functioning.

**Initial Presentation and Behavioral Conceptualization**

We became familiar with Dan when he was referred to our 3-week intensive outpatient pediatric pain rehabilitation program. Upon intake, Dan appeared slightly younger than his stated age and had a soft, high-pitched voice. He coughed repeatedly throughout the interview and moaned with apparent pain. Nevertheless, he was easily distracted from his pain and relatively indifferent to his debilitated state. He was alert, oriented and his mood was cheerful. He demonstrated dependency on his family, and frequently looked to his mother to assist him with the interview or other activities.

After a review of Dan’s history and comprehensive medical evaluations, the medical director and psychologist shared with Dan’s mother that, while a physiological underpinning may exist for some or many of Dan’s symptoms, deconditioning and fear of pain were likely contributing to his current behavior. Within the team, we further hypothesized that his symptoms may have been reinforced by attention, care, concern, assistance, and nurturing by his mother and other individuals. Also, we surmised that symptoms and pain behaviors may have allowed him to escape demands and expectations including academic, family, and social challenges, and avoid pain associated with functioning and rehabilitative treatment.

**Intensive Outpatient Pain Rehabilitation**

Dan and his family participated in a 3-week, 8 hr per day multidisciplinary treatment program aimed at helping teenagers with chronic pain improve their functioning. The program included physical therapy, occupational therapy, recreational therapy, biofeedback, cognitive behavioral therapy, and parent training, primarily delivered in a group format. Due to Dan’s extremely limited motor functioning, he also received individual physical therapy and a special reinforcement plan targeting oral intake of food. In general, parents were coached to reinforce improvements, use active ignoring of pain behaviors (e.g., grimacing, moaning, and coughing) and to avoid providing attention or eye-contact during Dan’s care needs (toileting, etc.). At first, Dan made physical gains and was able to stand in a walker for 1–2 min with significant assistance. During this time, staff noted inconsistencies in his motor movements. For example, he was unable to lift a very small weight, but would spontaneously use his arm to support his head.

Unfortunately, after 7 days Dan’s abilities resumed their decline; he lost initial physical gains, and eventually lost all ability to stand and move his arms or legs. Due to this seemingly progressive motor weakness, he was reevaluated by a neurologist. Two complete imaging studies of the neuraxis were entirely normal, he showed normal reflexes and there were no changes in muscle bulk or tone which would suggest a peripheral or central nervous system lesion. Due to the lack of progress and continued normal medical examination, after 11 days Dan was transferred to an inpatient child psychiatry unit for more intensive behavioral rehabilitation.

**Inpatient Behavioral Treatment**

Through a discussion with his mother, the primary goals for Dan’s inpatient treatment included improving mobility and independent functioning. The treatment team discussed with Dan’s mother that, in addition to deconditioning and avoiding pain, his symptoms may be reinforced by gaining attention and care from others. We stated that the inpatient program would allow greater control of the environment and the use of powerful reinforcers such as parental visits. His mother was receptive to this explanation and agreed to use her visits as rewards, although she acknowledged that it would be difficult to not see her son if he had not earned her visits. A PhD-level clinical psychologist and a postdoctoral fellow developed and modified behavioral treatments. Both of these psychologists observed Dan on a daily basis, adjusted the plan, reviewed behavioral data, and provided feedback and education to staff and Dan’s mother throughout the hospitalization.

At the outset of the hospitalization, we instituted a token economy system and behavioral data was tracked on a moment-by-moment basis. Dan earned points for any use of his hands, swallowing pills, participating in group treatment, and refraining from pain behaviors.
and habit cough for specific intervals. Dan could exchange his points for privileges including visiting with his mother, watching a movie, or going off the unit. Initially, improving oral intake was not a target of treatment in order to avoid reinforcement by having him fed by a parent or nurse. Dan earned points by attending group and refraining from coughing but earned very few for using his hands or otherwise moving; his ability to move independently continued to decline. Consequently, after 5 days, we implemented a shaping process to reward very small muscle movements during regular movement training sessions. In addition, the staff utilized differential attention with enthusiastic praise for Dan’s attempts at movement while ignoring bids for attention through symptoms. Despite this approach, Dan’s functioning continued to deteriorate; eventually he could barely hold his head up and needed assistance from several nurses with every activity. The nurses observed that he could not bear any weight and was quite limp. Physical therapy was discontinued due to lack of progress. We hypothesized that his deterioration represented an extinction burst related to the withdrawal of reinforcement for symptoms. However, the severity of his symptoms suggested the need for a different treatment approach.

Eight days into the hospitalization, the treatment team determined that the current plans were not working. Staff members had also noted inconsistencies in Dan’s abilities such as scratching his head or repositioning himself when he believed staff members were not watching. His mother acknowledged this was possible, but did not wish to implement any negative consequences without knowing his true abilities. Given the seriousness of his functional decline and the observed inconsistencies in his behavior, she agreed to our request to perform short episodes of covert video observations to determine whether he demonstrated increased functioning when others were not present. She did express concern that he might be angry or have a difficult time trusting her or future treatment; however, she stated that she would accept this potential consequence for the sake of his long-term health and functioning.

Results of the video monitoring provided a turning point when the team discovered that Dan was engaging in volitional movement when he was alone in his room. At several points in the video assessment, he ate candy from his desk, masturbated, and even left his bed and walked around his room to retrieve various items. These data dispelled any uncertainty over whether Dan could actually move and suggested that his disability was at least partially maintained by social factors such as receiving attention, care, and perhaps escaping some demands and expectations. This information was shared with his mother who supported modifying the treatment plan. She also expressed feelings of relief which seemed to strengthen her resolve to remain firm regarding the behavioral expectations.

Based on the information obtained from this assessment, the team reduced social reinforcers for debilitation by programming Dan independently at the end of the hall, where he could be monitored for movement and safety but was less influenced by attention from others. When Dan wanted to join the group or have a visit from his mother, his nurse instructed him to ring a bell that was placed an inch away from his hand. Although staff members frequently witnessed him making small movements, Dan never rang the bell and sat at the end of the hall for several lengthy periods over 2 days.

Given the lack of improvement using positive reinforcement techniques, we asked his mother for permission to confront Dan about this behavior; she agreed and provided further permission to share the recording and utilize negative reinforcement if Dan continued to deny his capabilities. At that point, a member of the treatment team (female psychologist) told Dan that the team knew he had the capacity to eat, walk, and essentially function normally, which he denied. Later that same day, the psychologist returned, disclosed that he had been recorded, and shared a portion of the recording. Dan appeared genuinely surprised and stated, “I can walk. It is a miracle.” However, he still reported that he was unable to move. At this point, a negative reinforcement approach was implemented. Specifically, because Dan had been described as a compliant child who did not like lectures, the same psychologist sternly and authoritatively demanded that Dan move his arms and sit up straight in his chair. This included the psychologist sitting very close to Dan and repeatedly making statements such as “You need to move your hand now” in a calm, but clear and serious voice. The confrontation immediately ended when Dan met the expectation, negatively reinforcing his movement. Using this approach, Dan demonstrated rapid progress and within 30 min was walking with a walker. He received immediate and enthusiastic praise along with a visit from his mother who was waiting outside the unit. Later that morning, he was able to feed himself a desired treat and expressed pride in his “miraculous recovery.”

Expectations were increased, and the rehabilitative approach continued with rewards for movement. When Dan’s functioning regressed, staff immediately demanded that Dan resume functioning. Given his improvement, he resumed physical therapy the same day, this time focused on strengthening and conditioning. Dan made rapid gains...
Six-Month Follow-Up

Six months after discharge, Dan returned for a follow-up appointment. Since discharge, he and his family had worked with a pediatric psychologist to monitor and adjust behavioral plans designed to encourage continued improvements in functioning. He had recently resumed physical therapy to improve his stiff gait; however, he was walking independently and eating without any difficulty. He no longer complained of pain to his parents and reported the use of independent pain management strategies that he learned in the pain rehabilitation program. He had returned to numerous activities he previously enjoyed. Additionally, his cognition had returned to baseline and he was completing his schoolwork as before.

Additional Cases

The success of Dan’s intervention informed the use of covert video monitoring for 3 subsequent adolescents treated for MUS (representing approximately 5% of the patients treated for MUS over the last 3 years at our inpatient hospital program). In each case, the approach was utilized only after other interventions failed. In addition, ethical considerations such as respect for privacy were deliberated in light of the severely debilitating nature of each patient’s symptoms and the implications to the patient and family of not effectively treating the patient.

In two of these patients, the covert video monitoring was revealed and discussed with the patient as a component of treatment. One patient responded with confusion and surprise at the information collected on the recording, even denying the information he was viewing; the other initially responded with anger, blaming her parent for being dishonest. Eventually, both were receptive to the explanation that the parent agreed to the procedure in the patient’s best interest. In the third case, parents requested that the patient not be told of the recording for fear that she would feel betrayed by her parents. In each case, covert monitoring provided important information regarding the role of environmental factors in the patients’ symptoms. Further, this information provided parents and staff with the confidence to implement new treatment strategies, and allowed increased expectations for normal functioning and symptom elimination.

Two patients returned to normal functioning with complete resolution of the symptoms that precipitated hospitalization. At a longer term follow-up, both of these patients remained symptom-free. The third patient remained symptomatic even after the video monitoring. In this case, the video monitoring data did not dispel parents’ questions regarding the origins of symptoms. They reported that the patient had a pattern of waxing and waning symptoms, and the monitoring must have recorded a “good day.”

Discussion

This case illustrates the utility of covert video monitoring as a means to determine actual functional ability independent of social factors and reinforcers. The severity of Dan’s symptoms and disability were exceptional, and quite alarming to his parents and medical providers. This prompted many diagnostic procedures, including imaging, nerve conduction studies, and blood work, with consistent negative findings. Of course, these tests were quite appropriate since missing the diagnosis of a degenerative, neurological, or seizure disorder could have drastic consequences (e.g., Spratt & Thomas, 2008). Along with these tests, Dan received a variety of appropriate treatments for his pain, and when interventions failed, diagnostic procedures were often repeated despite previous reassuring findings. Even after observations of inconsistencies in Dan’s abilities, his behavior was so extreme that treating teams remained concerned that there may be an as-yet-unidentified medical problem, and restricted treatment to rehabilitation and positive reinforcement (which are, notably, effective in most cases of MUS). It was not until the use of covert video monitoring that medical staff (and parents) were confident enough to establish clear expectations for functioning and apply negative reinforcement treatments, which were then effective. The three subsequent cases had similar histories, with significant symptoms and little response to standard treatments. Similar to the first case, the course of treatment changed after covert video monitoring demonstrated that social factors were contributing to the maintenance of symptoms. Unfortunately, video monitoring was not able to dispel the parents’ uncertainty for the third patient, perhaps due to a waxing and waning symptom presentation.

Legal and Ethical Concerns About Covert Video Monitoring

These cases raise important legal and ethical concerns regarding the use of video equipment to record patients without their knowledge. Interestingly, little has been written about covert video observation of children when parental consent is available, such as in these cases. This stands in stark contrast to the use of covert video to observe parents suspected of Munchausen’s Syndrome by Proxy.
Monitoring (MSBP), which has spurred numerous opinions and repeated debates in top medical journals (e.g., BMJ, 1998, 2001–2002, 2005; Journal of Medical Ethics, 1995–1996; Pediatrics, 1997, 2000) and legal publications (e.g., Flannery, 1998). The debate around covert video observation to detect MSBP involves a few issues. First, it has been argued that in many cases where MSBP is suspected, the purpose of covert video observation exists on a fine line between informing medical treatment and supporting legal prosecution (Morley, 1998). Second, waiting for video confirmation of the abuse requires the child to be put at risk at least one further time, which may be at odds with the medical oath to “do no harm” (Flannery, 1998). Third, covert video monitoring is an invasion of privacy, and may be at odds with the goal of fostering a trusting relationship between patients and their medical providers (Vaught, 2004).

Covert video observation of a child with parental consent avoids these first two concerns. However, privacy is still a concern, and an intrusion on any of the patient’s rights can only be justified when other less intrusive options have been exhausted and the intervention is done solely in the best interest of the patient (Vaught, 2004). Although developing a plan without the patient’s consent or knowledge also raises concerns, we feel this often can be done appropriately with input from the patient’s parent or caregiver and inclusion of multiple members of the medical team. In some cases, it may be necessary to seek advice from the hospital Ethics Board; this would be essential in cases when parents disagree with medical providers, parents disagree with each other, or there is disagreement within the treating team. This is certainly a decision that should never be made unilaterally.

**Recommendations for Use of Covert Video Monitoring**

Video monitoring is not required in the majority of cases of MUS. However, as the current cases illustrate, there are some situations in which that level of assessment can inform treatment in a way that is not otherwise possible. Some readers may consider the use of covert video monitoring for the assessment of challenging cases in their own practice. To this end, we provide a few recommendations and highlight areas to consider. These recommendations assume the monitoring is solely for clinical reasons, and has no legal ramifications. In any case where there are potential forensic or other legal consequences, the Ethics Board and Legal Department should be consulted, and we would encourage review of the articles cited in the previous section (e.g., Flannery, 1998; Morley, 1998; Vaught, 2004).

It is important to weigh the potential benefits of covert monitoring against the costs. Covert monitoring represents an invasion of patient privacy, and may also lead to decreased trust in medical providers or problems in the patient’s relationship with her or his parents. In the case study and additional cases, multiple treatments were attempted and failed before the use of covert video monitoring. Even when inconsistencies in behavior were clinically noted, standard rehabilitative and behavioral treatments were continued and modified for some time. The treatment team discussed covert monitoring only after the following conditions were met: (a) the treating team considered that the risk to the patient’s wellbeing of the continued disability outweighed those of the monitoring, (b) the treatment team thought that further treatment would be hindered by not understanding the role of social factors in the expression of the symptoms, and (c) reasonable treatments had stalled or been determined ineffective.

The decision to use covert video monitoring should never be made unilaterally, or by a small group, but should be discussed in large and diverse teams with possible external consultation or input (e.g., from a hospital Ethics Board). Also, parents should always be fully informed about the procedure, risks and benefits, and asked for their consent to the monitoring. In the current cases, the observation was first discussed within a treatment team including physicians, psychologists, social workers, nurses, and physical therapists. After deciding that the monitoring was warranted, we approached each adolescent’s parent(s) and discussed risks and potential benefits of the monitoring, made clear to the family the extent of recording, and stated that recordings would be destroyed (overwritten) after they had served their clinical purpose. We then obtained and documented consent with a specific form used for video recordings in our hospital. Hospitals may have differing guidelines about obtaining consent and destroying video data; providers should investigate applicable policies in their institution before beginning monitoring.

Revealing information from covert monitoring presents additional concerns. Parents have the right to know the results and see at least portions of the video should they wish, and ethical principles of integrity and respect (American Psychological Association, 2002) suggest the monitoring should also be revealed to the patient. However, it is incumbent upon providers to share this information in a clinically helpful manner and minimize negative consequences. This may include showing only selected portions of the recordings, debriefing as a family, discussing biopsychosocial contributors to pain and disability, and explaining that inconsistent behavior can
arise through behavioral factors. For example, certain behaviors in the presence of other people are reinforced by comfort, pain relief, and attention, but these same behaviors are not reinforced when others are not around; this reinforcement can lead a person to experience more symptoms in certain situations (Dahlquist & Nagel, 2009). Also, as illustrated by one of our additional cases, these guidelines are not hard and fast rules, and in one case we did not reveal the covert monitoring to the child, although we encouraged the family to discuss this when they were ready, and ideally with the support of a counselor. Finally, it is important that providers and parents prospectively agree to an endpoint for the covert monitoring, regardless of whether symptom inconsistencies are observed. In our experience, we have only needed to record on 1 or 2 days or nights, and so a 48- or 72-hr endpoint may be reasonable.

**Treatment Approaches for MUS**

Covert monitoring is not a treatment for MUS, but a tool for assessment, and treatment for MUS ideally begins with an analysis of factors that serve to maintain the behaviors or symptoms resulting in impairment. These factors may include fear of pain or of movement, increased attention from friends or family, changes in family relationships, decreased demands, or a host of other possibilities (Eminson, 2007; Vervoort, Goubert, Eccleston, Bijttebier, & Crombez, 2006). Once these factors are understood, treatment should seek to address factors maintaining impairment while reinforcing functioning and removing reinforcement for lack of functioning. Given the difficulty of eliminating all reinforcement for problem behaviors in the outpatient setting, psychiatric hospitalization or inpatient rehabilitation may be required in order to effectively treat patients with more severe symptoms (Deaton, 1998; Eminson, 2007; Nourse, Ryan, & McMenamin, 1999).

In less acute situations, outpatient behavioral treatment is effective to motivate functional behaviors (Camp & Negrini, 2000; Eminson, 2007).

The current case illustrates treatment approaches recommended in the literature. Following initial medical evaluation to rule-out significant pathology, Dan and his family were presented with a biopsychosocial interpretation of the symptoms, allowing for as-yet-unidentified physical contributors, and a rehabilitation or coping approach to impairment was described (e.g., Campo & Fritz, 2001; Deaton, 1998; Palermo & Scher, 2001; Schulman, 1988). We note that this same approach has been effective with many other adolescents that we have seen with similar pain and impairment. Treatment incorporated behavioral strategies to reinforce functioning and avoid reinforcing disability, as well as cognitive-behavioral strategies and relaxation training to help manage mood, worry, and physiological arousal (Eminson, 2007; Gooch, Wolcott, & Speed, 1997). This treatment was done on an outpatient and then an inpatient basis. Dan made no sustained progress with these interventions, and covert video monitoring provided definitive evidence of his ability to engage in more functioning than currently observed. Thus, backed by research suggesting that up to 50% of children stop fabricating their symptoms once they are confronted (Stutts & Hickson, 1999), we elected to confront Dan about his abilities. This also resulted in no change, so a negative reinforcement protocol was developed and implemented with parent permission (e.g., Campo & Negrini, 2000; Warzak et al., 1987), with continued positive reinforcement for increases in functioning. This finally resulted in significant and sustained improvement in Dan’s disability.

**Legal and Ethical Concerns About Negative Reinforcement**

The use of negative reinforcement during the treatment presents a potential ethical concern warranting discussion. Negative reinforcement is similar to punishment in that both involve the use of aversive stimuli to change behavior (Sidman, 1989). It has been well-documented that the application of an aversive stimulus can have side-effects including emotional responses, aggression, imitation of the aversive stimulus, and disruption of the relationship between client and the person delivering the aversive stimulus (Van Houten, 1983). However, these problematic side-effects can be minimized if the behaviors being targeted are well-defined, the plan is implemented consistently, and the overall treatment plan also includes generous use of positive reinforcement (Griffith, 1983; Van Houten, 1983). It is worth noting that all original treatments focused on positive reinforcement and shaping of behavior, and negative reinforcement was only implemented upon the failure of those treatments and sure evidence that the targeted behavior was possible. Further, opportunities for positive reinforcement remained; indeed, the shaping plan continued as soon as the implementation of negative reinforcement techniques resulted in the slightest reinforceable behavior.

**Conclusions and Future Directions**

Future research may demonstrate greater internal validity with the use of a single-subject or small sample design. Future research may also seek to determine if overt video monitoring could accomplish the same goals as covert
monitoring. Dan clearly modified his behavior when he knew he was being observed by parents or clinical providers, and this may have been maintained during overt monitoring. On the other hand, without the immediate social pressure of a human observer, he may have been less vigilant rendering overt monitoring effective with fewer ethical concerns.

Nevertheless, these cases provide an interesting contribution to the discussion of how to evaluate and treat complex cases of MUS. In these cases, an accurate understanding of the symptoms may have been impossible without video monitoring, and this evidence was essential to allow parental confidence in implementing effective behavioral treatment. The case study is also notable for the use of negative reinforcement; something quite atypical in our hospital, which relies primarily on positive reinforcement to encourage behavior and removal of privileges (negative punishment) to discourage behavior. Finally, despite significant impairment and a pattern of declining health and functioning, the majority of adolescents made a full recovery and maintained their improvement at follow-up. These cases illustrate that, with the combination of covert video monitoring and intensive behavioral treatment, even adolescents with severe impairment due to MUS can be effectively treated and return to age appropriate functioning.

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