Chapter 7

Collaborative Treatment Approaches

Integrating medication with nonpharmacological treatments

Robert King and Robert Carey

Learning Objectives

Readers will be able to:

1. Appreciate the value of a collaborative, interdisciplinary approach to challenging behaviours in individuals with developmental disabilities.
2. Understand the role of objective monitoring of the signs and symptoms of mental illness in the treatment process.
3. Appreciate the need to combine behavioural, environmental, counselling and medication interventions to address complex challenging behaviours.
4. Be introduced to various types of psychiatric medication.

Introduction

The biopsychosocial model, introduced by Engel in 1977, emphasizes the effects that events within systems and between systems have upon each other. In understanding the onset and course of mental illness in individuals with developmental disabilities (DD), this model endorses the identification of illness vulnerabilities, precipitants, perpetuants and protective factors in multiple domains of an individual's life. This information is

then utilized to best support individuals in times of crisis and emotional distress. Treatment support plans often require coordination of pharmacological, behavioural, psychotherapeutic and habilitative (environmental) interventions. This chapter will explore this concept.

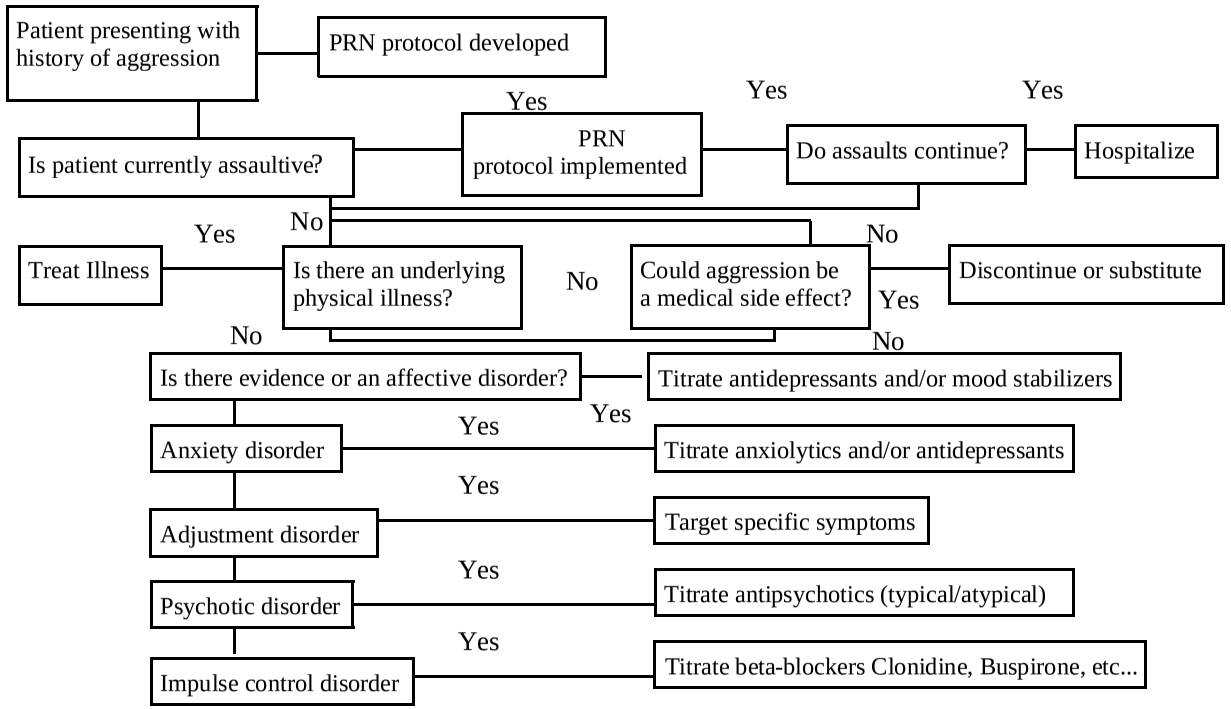
The prevalence of mental illness in individuals with DD is very high, 24-40% (Pyles, Muniz, Cade, & Silva, 1997). The use of psychiatric medication has been reported as also approaching 26-40% in community residential placements, and 35-50% in institutions in North America (David, Pyles, Muniz, Cade, & Silva, 1997). Unfortunately, these percentages attest to a historical overuse of a particular class of medication (neuroleptics or antipsychotic drugs). In the absence of a behavioural diagnostic process examining all domains of an individual's life, the prescription of these drugs may result in behavioural toxicity (impaired learning, skill acquisition and response to reinforcement contingencies) rather than improve quality of life.

Aggression, self-injurious behaviour, overactivity and sleep disturbance are all common changes in behaviour creating concerns amongst family members and support staff in the lives of individuals with DD. As illustrated on the following page, these behavioural changes are often linked to underlying cognitive (thinking) changes, and mood changes occurring in the context of:

1. adverse reactions to prescribed medications
2. distress arising from a physical illness
3. distress arising from mental illness

This algorithm highlights the fact that challenging behaviours in and of themselves are not disorders or illnesses, but rather potentially overt, symptomatic expressions of a variety of underlying etiologies. Myers (1998) has explored this relationship in affective disorders, documenting the risk of aggression in the context of an irritable or dysphoric mood. Disinhibition during hypomanic or manic phases of a bipolar disorder in in-

Figure 1- Decision Tree for Selecting Psychopharmacological Intervention in Adults with Developmental Disabilities Presenting with Aggression



dividuals with DD has been described. Attempts to avoid or withdraw from anxiety-provoking environments or interpersonal interactions are not uncommon in panic disorder, social phobia and generalized anxiety disorder. Again, aggression or self-injury may result in this context. Dissociative phenomena, flashbacks and hyperarousal in the context of post-traumatic stress disorder also increase the risk of aggression being exhibited, as does the interruption of the completion of compulsions in the context of an obsessive compulsive disorder. Rage outbursts in individuals with pervasive developmental disorders and Tourette syndrome, and in individuals with DD are also well described.

As discussed in Chapter 3 (The Biopsychosocial Approach to Challenging Behaviours), however, reliance upon the above algorithm alone in formulating an understanding of challenging behaviour would result in a unidimensional, and at times unidisciplinary approach to treatment. The dynamic interplay of the multiple contributants to the challenging behaviours of concern would be under-appreciated in the absence of an integrative biopsychosocial model. The utilization of this model by an interdisciplinary mental health team is well described in Chapter 10 (The Interdisciplinary Mental Health Team) of this book. The collaborative nature of team decision making in the assessment, formulation and treatment of clients with complex or multiple disabilities is stressed in this chapter. The reader is reminded in particular of the team's focus on operationalizing the signs and symptoms of hypothesized underlying mental health concerns, and the value of utilizing objective monitoring systems in the assessment and treatment phases of the intervention process.

Conducting a Biopsychosocial Analysis of Challenging Behaviour- An Integrated Approach

Multi-modal (biopsychosocial) models, as described in Chapter 3 and expanded upon below, utilize behavioural technology to:

1. perform functional, behavioural analyses of challenging behaviours.
2. support specifically the testing of hypotheses that mental illnesses act as instigating, vulnerability, and maintaining conditions in the context of challenging behaviours.
3. translate signs and symptoms of mental illnesses into observable behaviours that can be recorded and measured.
4. utilize the above measures to assist in determining the efficacy of prescribed interventions.

State-of-the-art models strive to:

1. improve quality of life as defined by an individual's goals.
2. teach appropriate and useful interpersonal, social, coping and self-management skills.
3. minimize or eliminate in a positive and non-intrusive manner individually unique biochemical and psychosocial conditions that contribute to challenging behaviour.

Examples of two of these multi-modal models are: (1) ***Gardner's Multi-Modal Contextual Behavioural Analytic Model*** (Griffiths, 1998), and (2) ***Carey's Positive Systems Approach*** (Carey, 1983).

Gardner's model is well described and illustrated with case examples in Chapter 3.

An example of a case which describes **Gardner's model** is presented below:

The Case of Peter

Peter was a 40-year-old man who was assessed as being at the mild range of developmental handicap. He had a long history of sexual assault towards female children, ranging in age from 9 to 18. Peter had been repeatedly charged for his offenses and had spent some time in jail -

usually placed in isolation because of his vulnerability to attack from other prisoners. Peter's sexual offenses included: exhibiting himself in public to young children; touching adolescent females in a sexual manner; making lewd remarks and threats to young females while staring at them in a very obvious and threatening manner. Peter was living in his own apartment with some Supported Independent Living (SIL) support (eight hours/week).

Instigating Conditions:

A Functional assessment of his behaviours revealed that the behaviour:

a) occurred in specific situations - namely, out in public places where he could enter into close, physical proximity with young pre-pubescent and adolescent girls;
b) usually occurred during unstructured free time - mostly during evenings and weekends, when he had no staff supervision;
c) were most likely to occur following the viewing of certain sexually explicit video tapes that were in his possession;
d) could also occur towards female staff - usually following a situation where they had made a request for him to do something to which he did not wish to comply.

Vulnerability Conditions:

Psychological assessment of Peter showed:

a) that his cognitive deficits were such that he had very poor abstract reasoning abilities, with short-term memory, and

poor sequential reasoning and problem-solving skills - suggesting poor social comprehension, and lack of ability to anticipate consequences;

b) a family history marked by sexual abuse when he was a child (perpetrated by an older female relative), as well as by a former employee of the agency that was supporting him when he was in his early 20's;
c) that he was diagnosed by a psychiatrist to have a Narcissistic Personality Disorder (DSM IV code: 301.81) with passive-aggressive features.

An analysis of his support system also revealed some problems that increased his vulnerability and predisposition to reoffend, and repeatedly engage in these behaviours. These included:

a) inadequate staffing resources to monitor his behaviours during the times when he was most likely to engage in them;
b) no medical involvement to evaluate factors related to testosterone levels and elevated libido;
c) poor choice of location for his residence (e.g., - located near a high school, shopping mall and several coffee shops);
d) family support system that tended to engage in denial regarding his potential to offend, and to create conflict for support staff as well as expose him to high risk situations when he came home to visit.

Consistent with Gardner's Multi-Modal Contextual Behavioural Analytic Model, the treatment approach that was devised for Peter encompassed behavioural, educative, biomedical and ecological interventions. Behavioural strategies were put into place for staff/family, providing firm limits to

specific behaviours that were carefully operationally defined to ensure consistent recording and intervention. In addition, Peter was taught pro-social communication, greeting skills, and he was provided with heavy positive reinforcement when these skills were displayed during the training sessions, as well as when there was evidence that they had generalized to daily living situations. Staff and family were educated with respect to the nature of the development of his sexually deviant behaviours, as well as to the nature of his personality disorder.

A psychiatrist was also involved, and diagnosed him with a Narcissistic Personality Disorder and Pedophilia. After an extensive medical work-up, Peter was placed on Depo-Provera medication (medroxyprogesterone acetate) to control his sexual urges and obsessional thinking. Peter was identified as a Type IV offender - or "paraphiliac" - these are individuals who associate sexual arousal, fantasy and fulfillment with unacceptable stimuli such as children. It is reported that only Type IV offenders (paraphiliacs) will respond to Depo-Provera treatment because the other three types either deny their behaviour (Type I), project blame for their behaviour (Type II), or enjoy exercising violent urges (Type III), and will not admit that their behaviour is out of control or inappropriate. Depo-Provera is an antiandrogen drug that lowers the blood serum testosterone levels in males by restricting the release of luteinizing hormones (LH) from the pituitary gland. The reduction of testosterone triggers a corresponding reduction in sexual interest and, therefore, helps to reduce recidivism. Furthermore, the drug works to effectively reduce the frequency of erotic imagery, and normally causes a temporary form of "impotence" (or interference with erections) which also helps to reduce recidivism. The drug was prescribed for Peter because it takes effect quickly, and positive results generally ap-

pear within six months of treatment.

In addition to the medical approach, Peter's entire support system (ecological intervention) was drastically overhauled as well. This included changing his residence, adding staff complement to the times of the week when he was most vulnerable, and building an alarm monitoring system into his residence so that he could not leave without alerting staff. Social work involvement was also important in terms of helping his family learn to accept the nature of his disorder, and to agree to cooperate with his programme in a consistent fashion.

Peter's incidence of sexual acting out dropped from an average of over twenty episodes per month to less than two per month within six months. He still requires a structured environment with sufficient staffing resources to be able to effectively monitor his behaviour 24 hours per day.

Carey's Positive Systems Approach is described by its author as "an amalgamation of different aspects of the major approaches that are currently in popular use" (in supporting individuals with DD and challenging behaviours) (Carey, 1998). These approaches include:

- **applied behavioural analysis**
- **behaviour communication theory**- acknowledging that challenging behaviours are often attempts to communicate needs, and advocating teaching more acceptable methods of self-expression
- **systems theory**- advocating the belief that systems are sets of components, which when coupled together, interact and influence each other to form a whole.
- **gentle teaching**- a concept developed by McGee based on the psychology of interdependence (seeing change as being mutual and bringing about a feeling of companionship in

the community). This philosophy advocates (a) teaching individuals to feel safe with caregivers, (b) teaching individuals to feel engaged, (c) teaching individuals to feel unconditionally valued, and (d) teaching individuals to return unconditional valuing.

Six individual factors are identified in this model in supporting individual growth and care:

1. ***Identification*** - understanding behaviour in the context in which it occurs. Similar to Gardner's model, this factor includes an evaluation of biomedical and mental health issues as instigators or perpetuants to challenging behaviour.
2. ***Communication*** - looking at an individual's behaviour as a form of communication that has function and meaning.
3. ***Stimulation*** - heightening exposure to fun and stimulating activities not contingent on behaviours.
4. ***Reinforcement*** - advocating intense non-programmatic and non-contingent reinforcement that occurs on a frequent basis.
5. ***Redirection*** - changing aspects of the individual's environment and interaction pattern; capitalizing on stimulus change opportunities.
6. ***Coping*** - teaching methods and skills to handle stressors and friction.

Carey has also identified six systemic factors which must be addressed in understanding and treating challenging behaviours. These are listed as:

1. ***Flexibility*** - the system must offer as much flexibility as possible in areas such as: staffing credentials, staffing scheduling, living arrangements, and day programme requirements.
2. ***Perseverance/Tolerance*** - support programmes must demonstrate strong agency commitment towards maintaining individuals in their community - rather than having indi-

viduals "fit" into a prescribed environment, a commitment requires service providers to establish an environment that is fluid, and can best fit individuals and their presenting needs and desires.

3. ***Consistency*** - one cannot implement a PSA approach on a part-time, haphazard basis. Protocols of support should be established to promote a positive, methodical response to the problematic behaviour.
4. ***Portability*** - the support plan must have the ability to move with persons in the various settings in which they interact - staff and family in all locations must be trained in the interactional approaches.
5. ***Intensity*** - this has to do with the frequency and quality of interactions with individuals during the course of the day.
6. ***Change*** - refers to rearranging the environment or teaching staff/caregivers to become sensitized to stimuli or triggers that cue behaviours, with a focus on prevention of these behaviours manifesting themselves.

An example of a case which describes Carey's approach is presented below:

The Case of Sally

Sally was 22 years of age and was being removed from a facility for children, and placed into the community. Sally was placed into the community, not because she was ready, but because she was over the age of 18. Sally had resided in the children's facility since the age of 2, placed by her schizophrenic mother, who could no longer deal with her. Sally's history further included severe self-abuse dating back to admission - head banging, head slapping with both her hands and objects. During adolescence, self-injury was so severe that Sally was considered

for neurosurgery as the only means of controlling her dangerous behaviours. Despite Sally's behavioural challenges, she still presented as an individual who was personable and quite bright (high functioning autism). Sally was able to operate a photocopier, and to collect money for copies made for workers at the facility. She was able to make change, and could relay amounts owing. When she was discharged into the community residence, which was a large core residence in a rural setting, she had high rates of self-injurious behaviour (SIB), and the recommended approach was to use a strong verbal reprimand procedure, followed by brief, contingent physical restraint (holding hands down at her side). The community agency was instructed to continue using this procedure, or else the behaviour would soon escalate to an 'out of control' state.

The behaviour gradually started to escalate - probably due to inconsistent administration of the procedure/ approach. There were 28 different staff personnel who worked with Sally over the course of any given week, all interpreting and implementing the procedure in a variant manner.

Sally's self-abuse continued to escalate to the point where her face frequently looked quite swollen and red. The many years of head slapping had also caused one of her retinas to become detached. Surgery was required. Sally's regular physician was away on vacation, and an unfamiliar doctor who witnessed Sally's self-injury in the office interpreted her behaviour to be indicative of suicidal behaviour, and immediately had an ambulance dis-

patched to take her involuntarily to a local psychiatric hospital. Sally's psychiatric admission included the use of a straight jacket. Her medications were significantly changed, and the incidence of her self-injury had risen to 2000 per day. Her hospital stay lasted 6 months. The old verbal reprimand and hands down procedure no longer worked. The case had escalated to a crisis point and the agency was considering a referral to a facility where shock treatment would have been used as a means of decreasing Sally's behaviours (even though previous shock treatment had not worked). Out of frustration and desperation, management decided to go with a Positive System Approach being recommended by one of the authors (Carey). The emphasis was to view Sally's behaviour as a form of communication, and to try to address her wants/ needs, using behavioural assessment, as well as providing staff with positive types of interaction strategies, designed to prevent the occurrence of the behaviour, and re-direct inappropriate behaviours while reinforcing alternative coping skills.

The PSA approach for Sally included:

a) Interpreting behaviour as communication - providing appropriate forms of stimulation - using re-direction, stimulus change, teaching more appropriate form of communication- understanding that Sally was communicating that she did not like the workshop and the task expectations. More choices needed to be available to Sally around her daily activities. Leisure and recreational activities needed to be incorporated into Sally's life. As staff became more aware and in-tune with the early warning signs of Sally's agitation and behaviour,

redirection and stimulus changes were employed to break the cycle of self-injury, and to bring about change. Staff also encouraged Sally to communicate verbally, and to convey her wants and needs in a more appropriate manner. Sally was provided opportunity to express herself, and to have control over her day to day activities.

b) Focusing on the relationship Sally had with her caregivers - the relationship was not to be one of power, control and compliance. A core team of five people who truly enjoyed and liked Sally was established, and they received special training in the new interactional style/approach. One of them was placed on each shift to facilitate the consistent implementation and modeling of the desired manner of how to respond and to interact with Sally.

c) Changing Sally's living environment - constructing a self-contained apartment in the large core residence so that Sally could have her own space, and was not disrupted by outside noise and chaos. This respected the fact that Sally has autism. Her residence was further adapted to include increased insulation to reduce noise and distractions.

d) Involving a psychiatrist who was well-versed in the field of autism to incorporate all elements of a biopsychosocial approach. After a complete medical, Sally's medications were changed. First, it was acknowledged that the most appropriate diagnosis for her was autism, and this suggested that her present regimen of heavily sedating drugs was likely ineffective. Sally was placed on Risperidone, and although this drug does not have an indication for the treatment of autism, recent studies suggest that it can improve the behaviour of individuals with autism (McDougle et al., 2000). Neurobiological research

has implicated the dopamine and serotonin systems in the pathogenesis of autism. We decided to go with this medication, as reports suggested that the serotonin 2A, and dopamine D2 antagonist Risperidone may be safe and effective in reducing the interfering symptoms of persons with autism.

e) Probing family history and considering re-establishing contact with Sally's mother. Contact was established and positive outcomes were reported by both parties.

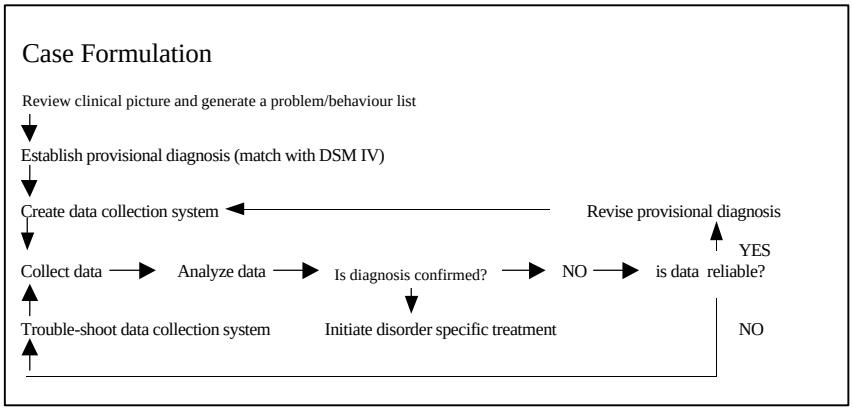
Overall, to the surprise of many, Sally's self-injury dropped from 2000 incidents per day to 200 per day within the first 6 months of implementing the new approach. A year later, self-injury was at zero frequency. This progress had never been achieved since Sally was admitted into a facility at 2 years of age. The behaviour remained at zero for several years and the case was closed.

Case Formulation

These models, which allow for implementation of state-of-the-art therapeutic modalities, including pharmacological support to individuals with challenging behaviour, base recommendations for multi-modal interventions on a ***case formulation*** process. An interdisciplinary team approach involving professionals with both mental health and behavioural analytic expertise allows the incorporation of these formulations into a unified process. An example of such a process is illustrated on the following page.

To participate in this interdisciplinary process, it is important for all members of the interdisciplinary team to have an understanding of the principles of pharmacological approaches to mental health concerns in individuals with DD.

Figure 2- Case Formulation Process



The Integration of Pharmacological Processes

The identification of a mental illness as an instigating, vulnerability or reinforcing condition to challenging behaviour has historically been hindered by the failure of clinicians to create a valid diagnostic and treatment formulation, invoking an absence of forethought regarding expected response to treatment, and a lack of established prospective outcome criteria. Again, it is important to remember that a psychiatric diagnosis is more than a label. Rather, it represents a hypothesis for the cause of the challenging behaviours observed, based on neurochemical (and potentially many other) variables (Sovner 1992).

The accuracy of the diagnosis of a specific DSM-IV disorder in individuals with DD, in the absence of an integrated biopsychosocial approach, is challenged by:

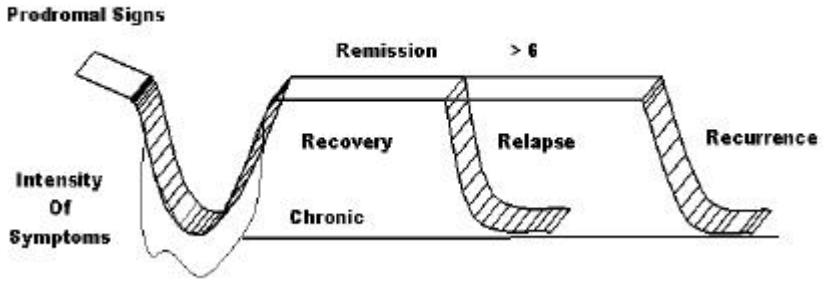
1. ***behavioural overshadowing*** - the attribution of an increase in the intensity or frequency of maladaptive behaviour to 'learned behaviour', rather than overt behavioural expressions of an underlying disorder.
2. ***diagnostic overshadowing (***Reiss, Levitas, & Szyszko, 1982***)*** - identifying maladaptive behaviour as being a direct outcome of the individual having a developmental disabil-

ity.

3. ***baseline exaggeration*** - failing to recognize that an increase in the frequency or intensity of a maladaptive behaviour may be signaling the onset of an underlying mental or physical illness, or an adverse effect of a medication.
4. failure to account for the impact of impoverished life experiences and communication deficits on the expression of signs and symptoms of mental illness.
5. failure to recognize that complex, concurrent disorders may occur at the same time.
6. misidentification of non-specific, stress-induced loss of adaptive functioning as an indication of a psychotic disorder (Sovner & Hurley, 1983).

It is important to remember that mental illnesses have natural histories with prodromal or early warning signs, acute episodes, possibly with critical periods of crisis, chronic episodes, and partial and complete remissions. All major psychiatric illnesses also carry risk, as illustrated below in Figure 3 using depression as an example of relapses (the return of symptoms in the first six months after remission) and recurrence (a second episode of the disorder beyond six months from the initial period of remission).

Figure 3– The Natural History of Depression



Four broad categories of pharmacological treatment are available to address psychiatric disorders:

1. *acute treatment* to treat acute signs and symptoms of illness.
2. *crisis management* or the utilization of PRN medication to address crises during acute phases.
3. *continuation treatment* to decrease the risk of relapse.
4. *maintenance treatment* to decrease the risk of recurrence.

The treatment formulation should ideally:

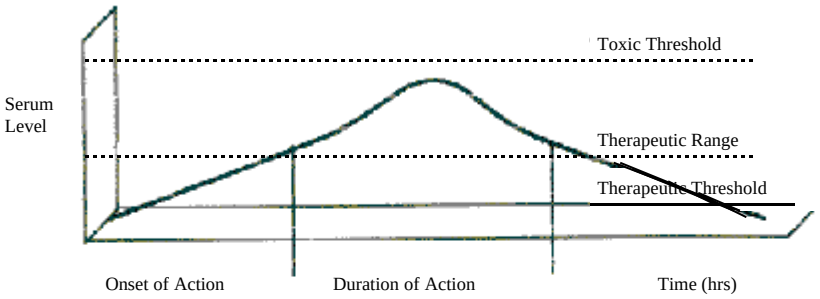
1. present evidence that the diagnosis is valid.
2. identify target symptoms which can be measured objectively to determine response to treatment - this concept has been advanced by Lowry (1997) through his model of ***An Assessment of Symptomatic Behaviours.***

Although focusing on mood disorders, Lowry's recommendations, as follows, are generalizable to all psychiatric disorders. He recommends:

1. establishing operational definitions of each symptomatic behaviour to allow caregivers to participate in the development of an objective monitoring system.
2. choosing an appropriate data collection system as dictated by existing known parameters of the behaviour in question (for example, frequency counts or a partial interval measuring system).
3. summarizing this data to graphically depict the course of the disorder and treatment outcome over time.
4. justifying the use of a specific psychotropic medication; and where applicable, rational combinations of medications.
5. defining criteria for an adequate drug trial based on a knowledge of:
    (a) the natural history of the disorder
    (b) knowledge of the properties of the drug as illustrated on the following page.

All psychotropic medications share the following properties depicted in Figure 4:

Figure 4– Psychotropic medication properties



- ***onset of action*** - the time required for medication to have an optimal effect. This is the time frame in which efforts to support the individual non-pharmacologically are particularly important.
- ***duration of action*** - this property determines appropriate dosing intervals (the minimum time between doses of medication).
- ***therapeutic range*** - the level of medication in the blood and brain achieved over a period of time by the prescription of a specific dose of a medication. This range is characterized by:
  a. a therapeutic threshold below which the drug has a suboptimal effect.
  b. a toxic threshold above which adverse effects increase in the absence of any further positive effects.

6. Establish expected goals of treatment - these can include:

- behavioural suppression - a goal in crisis situations only.
- behavioural stabilization - to induce quantitative rather than qualitative changes in chronic disorders.
- normalization - achieving remission and minimizing the risk of relapse and recurrence.

The following Table 1 illustrates the work of a behavioural therapist and residential counsellors in translating signs and symptoms of hypomania and depression in a non-verbal individual with a developmental disability, an autistic disorder, and a bipolar disorder into daily observable behaviours.

Table 1– Signs and Symptoms of Hypomania and Depression

Signs and Symptoms of Hypomania and Depression

Mania	**Depression**
Nonstop hyperactivity (e.g., pacing, rocking)	Hand biting leaving mark on skin
Knocking over or throwing objects repeatedly	Crying
Bringing same object to staff repeatedly	Public masturbation three or four times
Disrupted sleep (<4 hours sleep at night time)	
New words, almost sentences, improved expressive speech	Laying in fetal position in unusual place
Euphoric, loud and intense “eehing”, pronouced laughing	Inactivity– remained in one place for extended periods >1 hour

Physical aggression (e.g., hitting and/or pushing), urinating in odd places (e.g., laundry basket), and incontinence, are also followed but seem to be present in both phases.

(King & McCartney, 1999)

In crisis situations (times when an individual's coping skills are insufficient to deal with the increased stress brought about by the crisis), acute psychotropic medication and ***PRN (pro re nata medication as needed) protocols*** are necessary to minimize risk of harm to the individual in crisis, to peers and caregivers, and to minimize property destruction (King, Fay, & Croghan, 2000). Potential scenarios representing the time courses of crisis intensity are illustrated below. Again, it is critical to utilize an interdisciplinary team, and a biopsychosocial model in developing crisis plans which include the use of medication. The identification of instigating, vulnerability and maintaining conditions can assist in developing recommendations to reduce the frequency of crises (this is primary prevention). In turn, this will reduce the need for behavioural suppression with PRN medications.

Figure 5- Potential scenarios representing the time course of crisis intensity

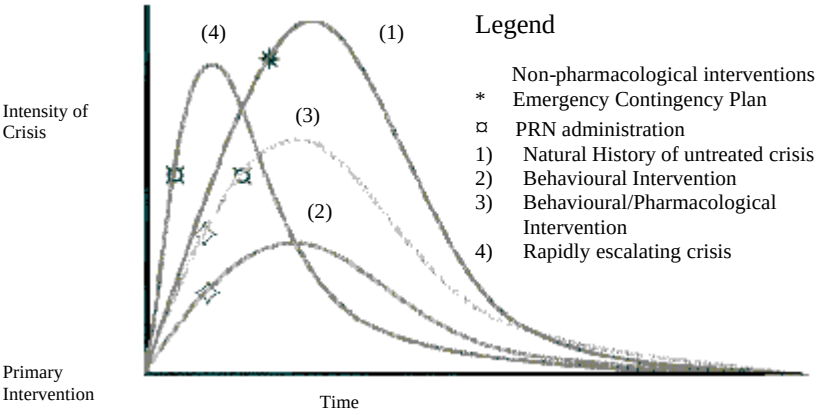


Figure 5 illustrates that:

1. Observable periods of onset, periods of peak intensity, and eventual spontaneous resolution characterize the natural history of crises (natural history).
2. Non-pharmacological interventions established in advance through team consensus, and a review of previous intervention outcomes, may well minimize crisis intensity and duration (behavioural interventions).
3. A historical review of previous crises may assist in decision-making regarding the timing of the use of PRN medication, thereby reducing crisis intensity.
4. A rapid escalation of challenging behaviours may necessitate urgent use of PRN medication concurrent with the implementation of an emergency contingency plan

It is important as advocates to ask medication prescribers:

1. Do we have the time to safely use this medication in the environment (onset of action)?
2. What can be done to support the individual in the interim until the medication begins to help?

3. What are the expected positive and negative effects of the medication (therapeutic and toxic thresholds)?
4. How long will the medication last (dosing interval)?
5. What should we do to ensure the crisis is resolved following the observation of a sedative or calming response to the drug?

Psychotropic Medication Classes

1. ***Benzodiazepines*** - as anxiolytic and sedative agents, these drugs target psychomotor agitation, anxious and fearful affects, and have a calming or sleep-inducing effect.

   Examples include: Lorazepam (Ativan), Diazepam (Valium), Oxazepam (Serax), Alprazolam (Xanax), Clonazepam (Rivotril) and Midazolam (Versed)

2. ***Antipsychotics*** - these drugs target psychomotor agitation and aggressive behaviour, particularly in the presence of psychotic symptoms (hallucinations, delusions and disorganized behaviour). There are two classes of antipsychotic medication:
   (a) traditional antipsychotics - examples include Haloperidol (Haldol), Chlorpromazine (Thorazine), Thioridazine (Mellaril), Methotrimeprazine (Nozinan), Trifluoperazine (Stelazine), Loxapine (Loxapac) and Perphenazine (Trilafon)
   (b) atypical antipsychotics - examples include Clozapine (Clozaril), Risperidone (Risperdal), Olanzapine (Zyprexa) and Quetiapine (Seroquel)

Their relative properties categorized as advantages and disadvantages, both in crisis situations and in the treatment of psychotic and other disorders, are listed in Table 2:

Table 2- Advantages and Disadvantages of Traditional Neuroleptics

Advantages of Traditional Neuroleptics	Disadvantages of Traditional Neuroleptics
1. The ideal neuroleptic should have: a. A rapid onset of action. b. An initial sedative effect. c. Few neurological adverse effects. d. A longer duration of action to minimize administration frequency. e. Good local tolerability if given intramuscularly or intravenously (Carey, 1998). *As a recent advance, intramuscular Zuclopenthixol Acetate (Clopixol Acuphase) offers a duration of action of 48 - 72 hours.	1. A risk of paradoxical response secondary to over sedation and akathesia. 2. Acute neurological adverse effects (including dystonia, spasmodic torticollis, oculogyric crisis) each with a potential negative impact on subsequent compliance. 3. Exacerbation of seizure disorders. 4. Sedative and anticholinergic adverse effects which may produce a delirium. 5. Exacerbation in post traumatic stress disorder of dissociative phenomena.

Atypical antipsychotics as a group provide fewer acute and long-term adverse effects compared to traditional neuroleptics. These adverse effects are illustrated in Table 3.

An expanding list of use of atypical neuroleptics in individuals with DD includes:

- Acute and maintenance treatment of schizophrenia and other psychotic disorders.
- Adjunctive mood stabilizers in bipolar disorder (BD).
- Acute treatment of hypomania and mania in BD.
- Tic suppression and treatment of oppositional behaviour in Tourette's Syndrome (TS).
- Adjunctive treatment in obsessive compulsive disorder (OCD).
- Symptomatic treatment of aggression, self-injury and agi-

tation in pervasive developmental disorders (PDD).

- Conversion strategy - switching from previously prescribed traditional neuroleptics to atypical antipsychotics to reduce the life-time risk of TD.

Table 3- Advantages and Disadvantages of Atypical Antipsychotics

Advantages of Atypical Antipsychotics	Disadvantages of Atypical Antipsychotics
1. A decreased propensity for extrapyramidal adverse effects and tardive dyskinesia.	1. A risk of agranulocytosis, particularly in the first six months of treatment with Clozapine.
2. Decreased risk of hyperprolactinemia (except Risperidone).	2. A theoretical risk of respiratory depression with combined use of Lorazepam and Clozapine.
3. Improved impact on the negative symptoms of schizophrenia.	3. Dose related risk of seizures with Clozapine.
4. Interaction with both Dopamine and Serotonergic systems.	4. Significant weight gain.

Antidepressants

- *Selective serotonin reuptake inhibitors* - through altering the transmission of the neurotransmitter serotonin, this class of medication also is used in the treatment of (i) panic disorder, (ii) OCD, (iii) social phobia, and (iv) bulimia.

  These drugs are generally well-tolerated in individuals with DD. Adverse effects include sexual dysfunction, nausea, vomiting, headache, insomnia, and a paradoxical increase in anxiety.

- *Novel antidepressants* -Venlafaxine (Effexor), Nefazodone (Serzone), Moclobemide (Manerix), Bupropion (Wellbutrin).

These drugs differ in the manner in which they influence specific neurotransmitters in the brain and fail to respond to one or more SSRI's.

- *Tricyclic antidepressants* - Examples include Amitriptyline (Elavil), Imipramine (Tofranil), Sinequan (Doxepin), Clomipramine (Anafranil).

  As older medications with multiple influences on neurotransmitters, these drugs are generally poorly tolerated in individuals with DD. Common adverse effects include sedation, tremor, constipation, dry mouth, blurred vision and orthostatic hypotension. These adverse effects often prevent the attainment of a therapeutic dose of the drug.

Mood Stabilizers

These drugs are used in the acute, continuation and maintenance phases of BD. They include Lithium Carbonate, Carbamazepine and Valproic Acid. Recent work suggests that newer anticonvulsants, Gabapentin (Neurontin) and Lamotrigine (Lamictal), also have mood stabilizing properties. Lithium, Carbamazepine and Valproic Acid can be monitored through serial assessments of blood levels to individualize doses, to minimize adverse effects, and to optimize treatment response. (See Table 4)

Stimulants

Methylphenidate (Ritalin) and Dexamphetamine Sulfate (Dexedrine) are used in the treatment of attention deficit disorder with hyperactivity (ADDH).

Anti-Parkinson or Anticholinergic Agents

This class of medication includes Benztropine Mesylate (Cogentin), Trihexyphenidyl Hydrochloride (Artane), Amantadine (Symmetrel) and Procyclidine (Kemadrin), amongst others. These medications are used primarily to counteract the

neurological adverse effects of antipsychotic medications.

Table 4- Mood Stabilizers

	Dosage Range (mg)	Serum Level Range	Target Symptoms	Common Adverse Effects
Valproic Acid	750-3000 mg/d	350-700 µmol/L	Acute Mania and Long term control	GI complaints, changes in appetite and weight, alopecia, ataxia, asymptomatic hepatic transaminase elevation
Carbamazepine	300-1200 mg/d	17-54 µmol/L	Acute Mania and long term control	Dizziness, drowsiness, blurred vision, diplopia, ataxia, headache, chills, tremors, dry mouth, nausea, fever
Lithium	900-2400 mg/d (acute) 300-1200 mg/d (maintenance)	0.8-1.2 mmol/L (acute) 0.6-1.0 mmol/L (maintenance)	Long term control and prevention or diminution of the intensity of subsequent episodes of mania and depression	GI irritation, muscular weakness, restlessness, slurred speech, blurred vision, dazed feeling, vertigo

Beta Blockers

Used primarily as antihypertensive agents, these medications, for example Propranolol, are also used for:

- the symptomatic relief of performance anxiety
- the treatment of neuroleptic-induced akathisia
- the treatment of Lithium-induced tremor
- the treatment of aggression, self-injury or other challenging behaviours in the context of states of overarousal, such as PDD

Clonidine

Indications include:

- tic suppression in TS
- ADHD
- symptomatic treatment of states of overarousal

Opiate Blockers

Example: Naltrexone.

Indications include:

- alcohol dependence
- self-injurious behaviour

Buspirone

Buspirone is a non-benzodiazepine antianxiety agent.

Indications include:

- agitation in dementia and head injury
- generalized anxiety disorder

Conclusion

This chapter has reviewed various state-of-the-art biopsychosocial approaches to dealing with the challenging behaviours exhibited by some individuals with a DD. An interdisciplinary process is critical to understanding the full nature and complexity that is frequently inherent in these cases. The principles of psychiatric diagnosis combined with the functional analysis of behaviour is a powerful combination of therapeutic traditions to apply to these challenging individuals. It is equally important that the consumers of these approaches

are familiar with the basic principles of safe and effective pharmacotherapeutic treatment as well as the ethical, moral and legal dilemmas that are often involved in behavioural treatments. This chapter highlighted two of the more popular multi-modal approaches being used today - Gardner's Multi-Modal Contextual Behavioural Analytical Model, and Carey's Positive Systems Approach. Both of these conceptual models of behaviour analysis focus on the more positive and least intrusive aspects of behavioural and systems interventions. These collaborative treatment approaches value and recognize the importance of understanding and working within systems, and it should be noted that systems theory originated in the traditional biological sciences, and has in recent years, been applied to the human sciences (Clarke & Crossland, 1985). It has become clear that clinicians can no longer work in an isolated fashion without considering that the human mind and body are part of a highly complex system (biological and social), and a thorough understanding of a problem affecting an individual can only be arrived at through the study and consideration of the whole system, and the interrelationships of the parts of that system, and how they impact on each other. The treatment approaches that were presented in this chapter are all grounded within a sound empirical, theoretical framework, and they represent effective and humane approaches to solving the puzzle that underlies many of the challenging behaviours presented by individuals with a DD.

Future interdisciplinary alliances between psychiatry and behavioural analysis can reap positive rewards. One of these areas currently being explored is the use of detailed behavioural assessment/recording/evaluation procedures to monitor and chart common side effects to psychotropic medications that are frequently used on persons with Developmental Disabilities.

This will permit careful analysis of the "cost-benefit" of such medications, and track any potential side effects for quicker response to medication adjustment.

Do You Know?

1. The manner in which medication treatment can be incorporated into a biopsychosocial model of challenging behaviour in individuals with DD?
2. Examples of state-of-the-art multimodal treatment approaches?
3. The names of the major classes of psychotropic medications?
4. How members of an interdisciplinary team can support the safe and efficacious use of psychotropic medication?

Resources

Crabbe, H.F. (1995). *A Guidebook for the use of psychotropic medications in persons with mental illness and mental retardation.* Second Edition. New London, CT: OmniCare Consultants Inc.

Reiss, S., & Aman, M.G. (1998). *The International Consensus Handbook: Psychotropic medications and developmental disabilities.* Ohio State University: Nisonger Center.

Tsiouris, J.A., & Adelman, S.A. (1997) *Guidelines and general Information on the use of psychotropic and antiepileptic drugs for individuals with developmental disabilities* . New York State office of Mental Retardation and Developmental Disabilities.

Mental Health Aspects of Developmental Disabilities
Telephone: 336-581-3700

Website: http://www.mhaspectsofdd.com

NADD Bulletin
Telephone: 914-331-4336
Website: http://www.thenadd.org

The University of Western Ontario Clinical Bulletin of the Developmental Disabilities Program
Telephone: 519-661-3804
Website: http://www.psychiatry.med.uwo.ca/ddp

Habilitative Mental Health Resource Network
Website: http://www.nbpsych.on.ca/HMHRN.HTM

Quality of Life of People with Developmental Disabilities
Website: http://www.utoronto.ca/qol/projpwdd.htm

Mental Retardation – A Journal of Policy, Practices, and Perspectives
Telephone: 301-604-1340
Website: http://www.aamr.org

OACL – Accreditation Ontario Newsletter
Telephone: 705-356-2782
Website: http://www.acl.on.ca

Dr. Bob Carey – PSA article/manuals
Website: http://www.members.home.net/bobcarey

References

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders (4th edition).* Washington, DC: Author.

Carey, R. (1983). *Positive systems approach.* Unpublished manuscript.

Carey, R. (1998). *Positive systems approach*. Unpublished manuscript.

Clarke, D.D., & Crossland, J. (1985). *Action systems: An introduction to the analysis of complex behaviour*. New Fetter Lane, London: Mehuen & Co. Ltd.

David, A., Pyles, M., Muniz, K., Cade, A., & Silva, R. (1997). A behavioral diagnostic paradigm for integrating behavior-analytic and psychopharmacological interventions for people with a dual diagnosis. *Research in Developmental Disabilities, 18(3),* 185-214.

Engel, G.L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196*, 129-136.

Griffiths, D., Gardner, W., & Nugent, J. (1998*). Behavioral supports: Individual centered interventions: A multimodal functional approach*. Kingston, NY: NADD Press.

King, R., & McCartney, J. (1999). Charting for a purpose: Optimal treatment of bipolar disorder in individuals with developmental disabilities. *Mental Health Aspects of Developmental Disabilities, 2(2),* 1-9.

King, R., Fay, G., & Croghan, P. (2000). Pro Re Nata: Optimal use of psychotropic PRN medication. *Mental Health Aspects of Developmental Disabilities, 3(1),* 8-16.

Lowry, M. (1997). Unmasking mood disorders: Recognizing and measuring symptomatic behaviors. *The Habilitative Mental Healthcare Newsletter, 16(1),* 1-6.

McDougle, C.J., Scahill, L., McCracken, J.T., Aman, M.G., Tierney, E., Arnold, L.E., Freeman, B.J., Martin, A., McGough, J.J., Cronin, P., Posey, D.J., Riddle, M.A., Ritz, L., Swiezy, N.B., Vitiello, B., Volkmar, F.R., Votolato, N. A., & Walson, P. (2000). Research units on pediatric psychopharmacology (RUPP) Autism Network. Background and rationale for an initial controlled study of Risperidone. *Child and Adolescent Psychiatric Clinics of North America, 9(1),* 201-224.

Myers, B. (1998). Major depression in persons with moderate to profound mental retardation: Clinical presentation and case illustration. *Mental Health Aspects of Developmental Disabilities, 1,* 57-68.

Pyles, D.A.M., Muniz, K., Cade, A., & Silva, R. (1997). A behavioral diagnostic paradigm for integrating behavior-analytic and psychopharmacological interventions for people with a dual diagnosis**.** *Research in Developmental Disabilities, 18(3),* 185-214.

Reiss, S., Levitas, G., & Szyszko, J. (1982). Emotional disturbance and mental retardation: Diagnostic overshadowing. *American Journal on Mental Deficiency, 86,* 567-574.

Sovner, R., & Hurley, A.D. (1983). Do the mentally retarded suffer from affective illness? *Archives of General Psychiatry, 40,* 61-67.

Sovner, R., & Hurley, A. (1992). The diagnostic treatment formulation for psychotropic drug therapy. *The Habilitative Mental Healthcare Newsletter, 11(12),* 81-85.