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The Case Formulation in Child and Adolescent Psychiatry

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Put simply, case formulation is a process by which a set of hypotheses is generated about the etiology and factors that perpetuate a patient's presenting problems and translates the diagnosis into specific, individualized treatment interventions. It is central to the practice of child and adolescent psychiatry. Even if not articulated explicitly, the case formulation guides all clinical activity. For example, how one understands a child's biologic vulnerabilities and how they interact with personality or family factors and the importance assigned to each clearly influence choices made in the assessment process and the treatment plan. Despite the widely acknowledged importance of case formulation, it is often taught cursorily in residency programs, and residents often perceive it as too challenging to actually perform [1]. Consequently, case formulation is often relegated to secondary status behind the DSM-IV-TR differential diagnosis. Such attitudes are manifested in the American Board of Psychiatry and Neurology Child and Adolescent Psychiatry certification examinations. When asked to formulate the case just presented, candidates generally return a perfunctory statement and transition quickly to discussion of DSM-IV-TR diagnoses.

How can case formulation be taught systematically and effectively to child psychiatry residents? This article reviews the various definitions of case formulation, differences between diagnosis and case formulation, how case formulation for a child patient differs from an adult patient, and case formulation in the context of residency training, including challenges for residents transitioning from adult psychiatry. It presents

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a suggested structure for constructing a biopsychosocial formulation that can be applied in a training setting. Several specialized types of psychotherapy formulation are reviewed in more detail. The article concludes with a case example of a child psychiatry resident's case formulation before and after discussion in supervision.

Definitions of case formulation

If one searches the literature on case formulation in child psychiatry, one finds a surprisingly small number of articles relative to its importance. The indices of several textbooks in child psychiatry (and adult psychiatry) yield no entries under formulation or any related terms. The nature of case formulation is made more ambiguous by the various terms used for it, which reflects lack of agreement on the definition of case formulation. Commonly used terms include clinical case formulation [2,3], diagnostic formulation [4], psychodynamic formulation [5–7], psychotherapy case formulation [8], and Engel's biopsychosocial approach to formulation [9].

Although these terms are used somewhat interchangeably, they have different emphases. There are, however, some areas of consensus and commonality. Case formulation generally refers to an integrative process that synthesizes how one understands the complex, interacting factors implicated in development of a patient's presenting problems. It is explicitly comprehensive and takes into account the child and family's strengths and capacities that may help to identify potentially effective treatment approaches. The case formulation serves as a testable explanatory model that gives rise to ideas for intervention and eliminates some options that do not fit the model. Described most succinctly by Nurcombe and colleagues [10], the formulation asks what is wrong, how it got that way, and what can be done about it. The case formulation is not static. Just as a child's "story" continues to unfold throughout the clinical process with added information, the case formulation evolves and is continually modified. It may start as rudimentary and become more elaborate over time.

Case example of the "whole story"

A 14-year-old girl had been in treatment with a child psychiatrist since age 11 for severe obsessive-compulsive disorder and generalized anxiety disorder symptoms. Numerous medication trials had only brought her partial relief. Attempts at cognitive behavioral therapy (CBT) or other psychosocial therapies had always met with resistance on the patient's part, and she generally seemed to be angry about having to attend therapy sessions. After 2 to 3 years of unsuccessful treatment, the patient revealed that she had a severe phobia to elevators and heights that was making her profoundly uncomfortable during sessions. She requested that treatment sessions—previously held on the tenth floor of the hospital—be conducted downstairs in the lobby of

the hospital. After this change was made, the patient rapidly became an active collaborator in treatment and responded surprisingly well to CBT.

The largest body of literature on case formulation is on the psychodynamic formulation. This approach is heuristically fertile in generating psychologically meaningful hypotheses that translate to psychotherapeutic interventions, but it does not adequately capture the increasingly recognized contributions of neurobiology and sociocultural influences to psychiatric illness. The biopsychosocial approach to formulation has become the most widely accepted comprehensive case formulation model. Described in 1980 by George Engel, the biopsychosocial formulation became an organizing principle for psychiatric education [9]. An internist with psychoanalytic training, Engel had a profound impact on the field of consultation-liaison psychiatry. Engel departed from the biomedical model of understanding medical illness, which he viewed as isolating components of illness, as would a bench scientist. His biopsychosocial model was based on systems theory, which conceptualized the person and the family as components of a hierarchically arranged "continuum of natural systems." He later emphasized the importance of dialogue between the patient and doctor in developing a shared narrative of the patient's private experience of illness. Through this dialogue they would discover the links between the patient's personal life and his or her experience of "falling ill" [11]. The American Psychiatric Association Commission on Psychotherapy offered the following definition:

> The biopsychosocial formulation is a tentative working hypothesis which attempts to explain the biological, psychological and sociocultural factors which have combined to create and maintain the presenting clinical problem. It is a guide to treatment planning and selection. It will be changed, modified, or amplified as the clinician learns more and more about the patient [12].

The sociocultural aspect of case formulation has received increased attention recently with the recognition that culture and ethnicity are often ignored or mishandled through ignorance, personal bias, or countertransference on the part of the therapist [13]. Cultural issues are important in child and adolescent psychiatry because they influence parenting style, developmental expectations, values and goals of the family, perception of symptoms, and attitudes about treatment. The DSM-IV attempted to improve coverage of cultural issues with inclusion of an outline for cultural formulation, although there are some limitations in its applicability to children and adolescents [14].

Differences between diagnosis and case formulation

Diagnosis and case formulation are different processes. Diagnosis is a categorical approach to describing symptoms that occur in reliable groupings, the aim of which is to establish predictive validity for treatment outcome.

Diagnosis is atheoretical and draws on the disease concept. Case formulation reflects a more dimensional perspective in which problems are viewed as being on continua from normal to abnormal. Case formulation synthesizes information into a theory as to how problems developed and how change might unfold. Jellinek and McDermott [15] described diagnosis and case formulation respectively as the "science and art of child and adolescent psychiatry." They commented on the tension between DSM-IV structured diagnostic interviews and traditional open-ended interviews using play materials, noting that the first is quantitative and seeks accuracy, whereas the second is more qualitative and seeks meaning. Turkat [16] stated that it is problematic when a diagnosis is used as a formulation, and the term diagnostic formulation itself is confusing.

The consensus, however, is that diagnosis and case formulation complement each other and should coexist. Diagnosis by itself does not encompass the complexity of the individual case. Generally the diagnosis does not tell the clinician how two children with the same diagnosis, such as obsessive-compulsive disorder, differ in terms of strengths, vulnerabilities, precipitants of symptom exacerbations, developmental impact of the symptoms, and meaning of the symptoms to the child and family. Case formulation is seen as a vehicle to supplement and apply diagnosis to the specifics of an individual's life. Case formulation also serves as a vehicle for converting a diagnosis to a plan for treatment, especially choice of type and timing of interventions [8].

Connor and Fisher [2] maintain that case formulation must be multitheoretical because the current state of knowledge in child mental health does not endorse any one theory of causality. It must allow for biologic, psychologic, and social "multicausality." They further describe diagnostic assessment as a "divergent" activity in which information from different domains is collected and case formulation as a "convergent" activity in which information is prioritized and integrated and relationships among the data are highlighted.

How the child and adult psychiatric formulation differ

The transition from adult to child psychiatry training presents residents not only with the challenge of learning to construct a much more complex case formulation but also of learning a whole new approach to doing evaluations. Many residents have no experience with child outpatients during their adult psychiatry training and are unfamiliar with integration of data from multiple informants and interacting perspectives. Residents have an exceedingly steep learning curve in the beginning of training as they acquire new skills in interviewing and interacting with children of different ages. New knowledge areas to master include normal and abnormal child development, common medical conditions that affect behavior, family systems theory, childhood psychiatric diagnoses, and pediatric

psychopharmacology. Learning about development must include the variations in normal development, the rapid changes in childhood influenced by temperament and cognitive capacities, and psychodevelopmental issues, such as internalized object relations, identity formation, and psychosexual development. The need to master all of this material is all the more pressing because of concerns about safety of interventions in a vulnerable child population.

The first difference in the evaluation of children that bears on case formulation is the fact that children, unlike adult patients, are not self-referred but are usually referred by a parent, teacher, or some other agent. The problem is not defined primarily by the patient, and child patients may not even see the behavior expected by the parents or school as desirable. This may be an ongoing aspect of the formulation that explains limited treatment success. Externalizing problems are more often the reason for referral, although they may not be the most psychologically relevant predisposing or precipitating issue from the child's point of view. The child evaluation must use information from multiple informants, requiring an understanding of the reliability and point of view of each informant. The clinician also must form therapeutic alliances with the child and caregivers while still attempting to retain objectivity.

The chief complaint voiced by a child's parents also carries with it their expectations for normal behavior, which are filtered through their own psychology and influenced by sociocultural factors. The parent's psychological vulnerabilities also may explain why they experience the child's behavior as so disturbing. When the referring agent is outside the family it may even have different ways of labeling or defining problems based on its own internal requirements. For example, when a school refers a child it may prefer an autism spectrum diagnosis to establish eligibility for special education services. The main goal of child psychiatry interventions is to help the child return to a more normative developmental trajectory, usually defined by the parents' expectations. The child's level of development, which may differ across developmental domains, is always an essential part of the formulation. The focus of the formulation may change over time with the child's maturation, continuing and new environmental factors, and added information.

The conceptual model used to formulate the child's problems must of necessity be multifactorial and interactional. There is generally an individual component (focused on pathology within the child) and a systems-based component (focused on factors in the family or broader systems); an even more comprehensive ecologic approach is based on analysis of all contributing factors in the environment. The ecologic perspective is discussed, in more detail, in the article by Storck and Vanderstoep elsewhere in this issue [17]. Family assessment and inclusion of family factors are always necessary in the case formulation of a child. The cause of the child's problems also may be understood as circular. Family factors contribute to the child's

problem, but the child's problem in turn causes more family stress, which serves to perpetuate the problem. Causative factors that are more current and immediate are most relevant, because they most powerfully alter the balance for the child, the reinforcement available for change, and the beliefs of the participants [18].

Case example of the ecologic model

A 15-year-old girl was receiving services in a community mental health center. Her resistance to following rules and statements of suicidal ideation were causing her adoptive parents to feel so overwhelmed that they expressed concern that they could not continue taking care of her. The girl had received individual therapy for 2 months with little improvement. Attempts to add family therapy and recommendation of home visits were too little, too late, and the young woman was placed in a wilderness program and then was to go to a residential center far from her community and family. Later, it was learned that the adoptive father, a self-employed farmer, was under enormous stress and was concurrently filing for bankruptcy. This situation contributed significantly to the family's inability to grapple with rebellious behavior that represented a normative developmental challenge for this young woman.

The case formulation process assists in helping the child and adults to reach a shared definition of the problem, which is important if change is to be possible. A collaborative model in which families are partners in the case formulation process has been recommended [18,19]. Each partner in the process shares his or her formulation of the problem, comes to see some validity in the others' perspectives, and identifies what role he or she expects to play in addressing the problem. Added to the collaborative model is an emphasis on strengths-based approaches that have been embraced by system-of-care reforms and the family and consumer movement [20]. Metz [19] offered the following modifications of the American Psychiatric Association Commission on Psychotherapy's definition of the biopsychosocial formulation to reflect these perspectives (changes appear in bold):

> A biopsychosocial formulation is a tentative working hypothesis **developed collaboratively with the child and family,** which attempts to explain the biological, psychological and sociocultural factors which have combined to create and maintain the presenting clinical **concern and which support the child's best functioning.** It is an **individualized** guide to treatment planning and selection. It will be changed, modified, or amplified as the clinician **and the family** learn more and more about the **strengths and needs of the child and family.**

The involvement of multiple systems in the lives of children (eg, school, health care, neighborhoods, child care, and, for some children, child welfare or juvenile justice) also contributes to the greater complexity of the child psychiatry case formulation.

Case formulation approaches related to psychotherapeutic models

The clinician's preferred explanatory and psychotherapeutic models have significant influence on the prominent themes and hypotheses developed in the case formulation. One of the risks in case formulation is that of eliminating what does not agree with one's theoretical orientation. This issue has lent support to use of the more structured and comprehensive biopsychosocial formulation [10].

Case example of the role of the clinician's biases and theoretical models

An 11-year-old boy was admitted to a child psychiatric inpatient unit for treatment of severe obsessive-compulsive disorder refractory to multiple psychopharmacologic trials. The referring practitioner, a psychopharmacology specialist, indicated that the family functioned well and family issues should not be a target of treatment, and the inpatient treatment team followed this formulation. The boy was discharged and then rapidly readmitted with continuing severe symptoms. On re-entering the inpatient setting he stated urgently "my family's all messed up!" This statement confirmed the nursing staff's observations during the prior admission. They had observed that the boy's parents were intensely controlling and not psychologically minded and that the sister also had significant emotional problems that were not being acknowledged.

Psychodynamic and cognitive-behavioral case formulations do have their place in developing the specific components of the intervention once it is chosen. The two most common types of therapeutic case formulations, CBT and psychodynamic, are described later. More extensive descriptions of case formulation approaches used in CBT, psychoanalytic therapy, brief psychodynamic therapy, dialectical-behavioral therapy, interpersonal psychotherapy, and behavior therapy are also available [8,21,22].

Psychodynamic case formulation has been written about extensively, especially in the adult literature. Psychodynamic formulations are thought to be appropriate not only for long-term or psychodynamic therapy but also to inform other modalities [7]. McWilliams [22] holds that the shorter the time to do the psychotherapeutic work the more critically important are the therapist's working hypotheses. The psychodynamic framework addresses such areas as unconscious conflicts, ego deficits, distortions in intrapsychic structures, and problems in internalized object relations [23]. Psychodynamic case formulation assumes that the goal of therapy is not only symptom relief but also development of insight, agency, identity, self-esteem, affect management, ego strength and self-cohesion, a capacity to love, work, and play, and an overall sense of well-being [22].

Cognitive-behavioral case formulation is based on premises originally set forth by Aaron Beck and colleagues about cognitive schemas and information processing errors that lead to and maintain symptoms in depression, anxiety, personality disorders, and substance abuse [24]. CBT formulations

are used to identify negative core beliefs related to negative developmental events and generate cognitive restructuring and coping strategies [25]. Case formulation in cognitive therapy identifies a patient's automatic thoughts and feelings and behaviors that follow them and then identifies sources or triggers that activate the patient's symptoms. Eventually, connections are made between an incident in the child's life to core beliefs about himself or herself. Behavioral therapy formulations are particularly relevant in child psychiatry, because young children are most likely to benefit from restructuring of environmental reinforcements and may not be able to use the cognitive component of therapy. Behavior therapists focus on functional analysis of behavior and identify environmental contingencies or reinforcement and apply behavioral principles, including operant and classical conditioning, to make alterations [8].

Integrative case formulations are multitheoretical and allow for integration of components of different therapeutic modalities. Theoretical explanatory concepts are explicitly selected because of their applicability to the facts of the case and to guide individualized treatment approaches acceptable to the patient at a particular time. For example, a CBT case formulation may be most beneficial for an adolescent with generalized anxiety disorder or social phobia, but this does not exclude psychodynamic hypotheses in the case formulation to explain the meaning of specific symptoms, the readiness of the patient to address them, and developmental insults that may have played a role in symptom development. Integration occurs in the mind of the therapist as he or she develops the case formulation, not always in the therapeutic application (K. Zerbe, MD, personal communication, 2005). This perspective led to development of an integrated course on psychodynamic and evidence-based psychotherapies for children and adolescents at Oregon Health and Science University child psychiatry residency program [26]. Readings for the course are drawn from the literature on CBT, interpersonal therapy, and psychodynamic theory, paired with continuing case presentations. Review of evidence-based psychotherapy manuals is another part of the curriculum. Residents develop evolving integrated case formulations using different explanatory theories and discuss implications for selection of psychotherapeutic modalities that may vary over the course of treatment.

Case formulation in the context of residency training

Case formulation is valuable as a teaching tool in residency programs. It strengthens a resident's understanding of the multifactorial and transactional nature of childhood psychopathology and the process of matching treatment to the individual needs of patients. It establishes hypothesis testing as the norm and can encourage investigation of the evidence base for explanatory theories and treatment interventions. Surveys suggest that psychiatry residency programs view case formulation as important but do not

provide clear guidelines for how to construct formulations [8]. Even experienced clinicians may not routinely construct comprehensive case formulations, and most agree that case formulation is a poorly defined and undertaught skill [8]. Perry and colleagues [6] described five misconceptions to explain why clinicians do not regularly do case formulations: (1) the belief that case formulation is only for patients in long-term psychotherapy, (2) the view that case formulation is primarily a training experience and unnecessary for experienced therapists, (3) the belief that case formulation is an elaborate and time-consuming process, (4) the view that a loosely construed formulation ''in one's head'' is sufficient and does not need to be written, and (5) the worry about becoming so invested in a formulation that one will not accept information that does not fit the formulation. They counter by arguing that case formulations are just as important for short-term as for long-term treatment, are best in written form, need not be time consuming, and facilitate understanding of events that may not fit the formulation. Shapiro [7] added a sixth misconception: formulation is only useful for individuals who plan to do a dynamic therapy with a child. He emphasized that dynamic understanding also may guide a clinician toward other therapies. It is also important for understanding the significance of symptoms to children and their families and the risk of changing the dynamic equilibrium of the person treated and of the family.

Various factors contribute to resistance on the part of residents and faculty to learning and teaching comprehensive case formulations. Development of a case formulation is a longitudinal process. It requires sufficient time to get to know a child and family and the role of all the interacting contextual variables. In practice, formulations are continually revised with new information. This may be a challenge, with financial and managed care constraints leading to shortened lengths of stay in outpatient, residential, and inpatient settings. Residents need cases of sufficient duration to develop and refine good case formulations. Residents' formulations may be rudimentary early in training and should be more comprehensive as their skills expand over time. They may be more likely to focus on biologic issues early in training and gain more comfort in incorporating psychological and sociocultural issues over time. The fact that most child psychiatry residents enter child psychiatry after their third year may complicate this progression, however. In adult psychiatry they have spent much time in fast-paced inpatient settings in which there is not enough time or knowledge of the patient to go beyond differential diagnosis. They have not had the benefit of a fourth year, which generally offers added experience in longitudinal and in-depth psychotherapy. Instead, when they come to child psychiatry they are thrust into a different world in which formulations require consideration of multiple interacting contextual factors, such as the parents' own psychological issues, family dynamics, and the quality of the child's school environment. Residents who come from adult psychiatry are more accustomed to seeing a patient as an individual rather than in the context of a family or other

systems. They no longer come into child psychiatry training with a predictable exposure to psychodynamic and family systems theoretical models.

When asked to formulate cases, residents may be apprehensive about "not getting the right answer," because there is no checklist or prescribed formula for case formulation. Contrast this with the more typically enthusiastic reaction to a rating scale that is easy to administer and score and yields what seems to be (but often is not) a clear answer. Teaching faculty are not immune to these factors either and may prefer to engage in discussion of areas that are perceived as more tangible and better defined, such as psychopharmacology. Residents do not understand how case formulation can be useful. They may be aware of case formulation as a requirement for the American Board of Psychiatry and Neurology oral examination, but they do not know how it can inform and guide treatment. It can become another burdensome requirement, or it may not actually be required in their clinical rotation sites. Most written documentation is driven by medicolegal or insurance requirements and includes the five-axis DSM-IV-TR diagnosis but not necessarily a case formulation. Case formulation is often not a formal part of the curriculum and the literature to support teaching it is scant. Most of the available articles are about psychodynamic case formulation in adults. The implicit message is that case formulation is not essential.

To address these problems, case formulation should be made a formal part of the curriculum in child and adolescent psychiatry. Case formulation should be taught in didactic seminars, case conferences, and supervision, and some written case formulations with supervisory feedback should be required. The process of learning to formulate is enhanced by case conferences, in which experienced clinicians demonstrate the construction of a comprehensive biopsychosocial formulation. Especially useful is the opportunity for residents to observe faculty doing case formulations "in the moment" after seeing a new case. It also can be helpful to distribute written examples of a succinct, well-written comprehensive case formulation. One way to practice formulation is to construct it as a group, having each resident take a turn contributing part of the formulation. The discussion includes how to develop specific treatment plans based on elements of the formulation, including the timing of different interventions and the prognosis. It is essential to create a nonjudgmental climate in which any formulation ideas are acceptable and seen as having merit.

Too often case formulations are taught as part of the initial assessment but not in the context of cases as they evolve in treatment. It is important to illustrate how an evolving formulation changes the treatment plan in significant ways or, in some cases, may explain a poor response to treatment. It is also helpful to revisit cases later in the course of treatment that had been formulated in case conferences. This review provides an opportunity to see whether the hypotheses generated were borne out and how new information obtained in the course of treatment modified the treatment plan. In a similar vein, the case formulation should generate hypotheses about prognosis. It

should identify potential obstacles or areas of resistance that may arise in the treatment process and how to address them. A case formulation also can include consideration of issues that may arise in the therapist's reaction to the patient and family that might present obstacles to progress. For example, a resident who knows that she or he identifies with a rebellious adolescent wanting more autonomy may have difficulty developing a constructive alliance with the parent. Residents also need to learn how to integrate formulation of the parents' psychological strengths and vulnerabilities with the child formulation. This understanding is critical to engaging the parents in a constructive therapeutic alliance, without which treatment of the child is generally unsuccessful.

Construction of the case formulation

The case formulation process begins with a comprehensive assessment that includes interviews with the child and the parents together, the parents alone, the child alone, and review of ancillary sources of information. The order of these components varies depending on the age of the child, the presenting problems, and other contextual factors. Broad-band and specific symptom rating scales can augment the data collected and may be an easier way for participants to share some information. Information should be gathered in the areas needed to identify a DSM-IV-TR diagnosis and construct a comprehensive biopsychosocial formulation as described in Table 1 and Box 1. The chief complaint and goals for treatment should be ascertained from each participant, and the signs and symptoms should be elicited and characterized with respect to onset, precipitants, severity, observable patterns, the contexts in which they occur, and their effect on the child and family. A complete medical, developmental, and educational history should be taken, as should a family assessment and information about the patient's social functioning and sociocultural or environmental factors contributing to the problems. Strengths in the child and family should be identified and acknowledged throughout the interview and data collection process.

In the assessment of a child there is a need for balance between direct observation and inference from limited or indirect information. This balance is especially important in children with less ability to verbalize and about whom more inferences are made. The mental status examination is an opportunity to directly observe and assess areas of the child's functioning needed for the differential diagnosis and biopsychosocial formulation. The mental status examination in child psychiatry uses multiple assessment methods, including verbal interaction, play, and drawing or other expressive activities. Each modality provides information about the child's capacities, thought content, and way of relating to others. Areas in the mental status examination relevant to the case formulation include observable signs, such as psychomotor

Table 1
Biopsychosocial formulation grid with examples of predisposing, precipitating, perpetuating, and protective factors in each of the formulation domains

Domains	Biologic	Psychological	Social	
Factors	Genetic, developmental, medical, toxicity, temperamental factors	Cognitive style, intrapsychic conflicts and defense mechanisms, self-image, meaning of symptoms	Social–Relationships Family/peers/others	Social–Environment Culture/ethnicity, social risk factors, systems issues
Predisposing (vulnerabilities)	Family psychiatric history, toxic exposures in utero, birth complications, developmental disorders, regulatory disturbances	Insecure attachment, problems with affect modulation, rigid or negative cognitive style, low self-image	Childhood exposure to maternal depression and domestic violence, late adoption, temperament mismatch, marital conflicts	Poverty, low socioeconomic status, teenage parenthood, poor access to health or mental health care
Precipitating (stressors)	Serious medical illness or injury, increasing use of alcohol or drugs	Conflicts around identity or separation-individuation arising at developmental transitions, such as puberty onset or graduation from high school	Loss of or separation from close family member, family move with loss of friendships, interpersonal trauma	Recent immigration, loss of home, loss of a supportive service (eg, respite services, appropriate school placement)
Perpetuating (maintaining)	Chronic illness, functional impairment caused by cognitive deficits or learning disorder	Use of self-destructive coping mechanisms, help-rejecting personality style, traumatic re-enactments	Chronic marital discord, lack of empathy of parent, developmentally inappropriate expectations	Chronically dangerous or hostile neighborhood, trans-generational problems of immigration, lack of culturally competent services
Protective (strengths)	Above-average intelligence, easy temperament, specific talents or abilities, physical attractiveness	Ability to be reflective, ability to modulate affect, positive sense of self, adaptive coping mechanisms	Positive parent-child relationships, supportive community and extended family	Community cohesiveness, availability of supportive social network, well-functioning child/family team

Adapted from Barker P. The child and adolescent psychiatry evaluation: basic child psychiatry. Oxford, UK: Blackwell Scientific, Inc.; 1995.

Box 1. Construction of the formulation and generation of a treatment plan

1. Brief summarizing statement that includes demographic information, chief complaint, and presenting problems from child and family's perspective and course (onset, severity, pattern) of signs and symptoms
2. Precipitating stressors or events
3. Biologic characterization
4. Psychological characterization
5. Family and other interpersonal factors
6. Sociocultural and environmental factors
7. Role performance, including level of functioning in major areas of daily life
8. Strengths and protective factors of the child, family, and system
9. Differential DSM-IV-TR diagnosis
10. Integrative statement: how the factors interact to lead to the current situation and level of functioning, prognosis, and potential openings for intervention
11. Problem list
12. Treatment plan

Note: the four ''Ps'' should be included in steps 3 to 8.

abnormalities, the child's description of his or her symptoms, the child's affective states throughout the interview and predominant mood as observed and described, language and motor functioning, cognitive functioning, thought process and thought content or perceptual abnormalities, wishes, self-concept; view of the family, developmental conflicts and other psychological themes, judgment and the capacity for self-observation and insight, and motivation to change and availability to engage in treatment. Of significant importance in the assessment of a child is the identification of strengths and protective factors. Strengths in the child and family can be used as foundations for treatment interventions; they generate motivation for working on the challenging areas through formation of a positive therapeutic alliance and instillation of hope. The child and family's views of the problem and its causes and areas they identify as strengths are cornerstones in building a collaborative evolving case formulation.

The biopsychosocial formulation grid in Table 1 adapted from Barker [27] provides a structure that can be useful for residents. The information gathered in the assessment is put into a biopsychosocial framework, which addresses each of the three domains—biologic, psychological, and

social—with regard to the following factors, which have been called the four "Ps" [27,28]:

1. Predisposing factors are areas of vulnerability that increase the risk for the presenting problem. Examples of biologic predisposing factors include genetic loading for affective illness and prenatal exposure to alcohol.
2. Precipitating factors are typically thought of as stressors or other events (they could be positive or negative) that have a time relationship with the onset of the symptoms and may serve as precipitants. Examples of psychological precipitating factors may include conflicts about identity or separation-individuation that arise at developmental transitions, such as puberty onset or graduation from high school.
3. Perpetuating (or maintaining) factors include any conditions in the patient, family, community, or larger systems that serve to perpetuate rather than ameliorate the problem. Examples include unaddressed parental conflict, in which a child becomes an identified patient, a poor match between the educational services, and the child's learning needs.
4. Protective factors (strengths) include the patient's own areas of competency, skill, talents, and interest and supportive elements in the family and the child's extrafamilial relationships. Examples in the social domain might include the child having a good relationship with an understanding elementary school teacher or a favorite uncle. In the biologic domain, the child might have a talent in sports or music that can be helpful in engaging him or her in treatment and enhancing self-esteem.
5. Prognosis and potential for change is an additional "P" that should be included in the case formulation. This includes identification of areas most amenable to change and potential obstacles to successful treatment, such as when a youngster with school avoidance is rewarding by being allowed to stay home for long periods of time.

This grid can be used to facilitate comprehensive examination of areas needed for a biopsychosocial formulation. After these factors have been reviewed, the formulation should be used to develop a problem list, differential diagnosis, and generation of a treatment (see Box 1). This content can be translated into a succinct narrative as illustrated in Box 2 using the resident's case formulation example.

Using supervision to co-develop and refine a case formulation: a child psychiatry resident's case example

The following formulation presented in two parts followed by a postscript illustrates the interactive, evolving co-development of a case formulation in supervision. The resident developed the first formulation after 2 months of

treatment and revised the formulation to incorporate additional elements after discussing the case with the supervisor.

First case formulation

A 17-year-old girl was referred for her first psychiatric evaluation after 8 months of unsuccessful treatment for pain of unclear origin. The immediate reason for referral was the patient's worsening symptoms of depression and new onset of visual hallucinations. These symptoms had developed gradually after a febrile illness (presumed to be viral) that presented with vomiting and diarrhea. Her vomiting failed to resolve after the infection cleared, however, and had led to a 25-pound weight loss. No medical cause had been found for the intractable vomiting.

Relevant prior history included additional gastrointestinal difficulties. She had had multiple diagnostic procedures, which were ultimately inconclusive. In the initial interview the patient did not express any distress about her persistent vomiting, although she did report feelings of overwhelming depression and being scared by "visions of people in my room." Her mother, whose primary concern was her persistent vomiting, brought a calendar and a diary to the interview that contained detailed documentation of her vomiting. It was not learned until the sixth visit that the patient's vomiting had started insidiously approximately 6 months before the presumed viral infection. Around that time she had a major conflict with her biologic father and decided to stop contact with him.

She also had a history of academic underperformance. A school psychologist's evaluation, performed before the onset of her medical problems 4 years ago, did not qualify her for special education but recommended counseling. The patient's mother decided at that time to home-school her to improve her academic performance. Initially, they were part of study groups with other home-schooled children. Because of the patient's multiple medical problems, low energy, and inability to get out of bed on most days, however, the mother withdrew her from the groups. The patient's social interaction with peers her age has been limited to a weekly youth group at church. She reported that she has never been able to have a friendship lasting more than a month. She is overly sensitive to others' comments and often loses interest in friends after they disappoint her.

There seemed to be significant enmeshment and ambivalence in the mother-daughter relationship. The patient uses somatization as a way to express her feelings. Although her visions are clearly distressing, they have a phobic, rather than psychotic, quality. She was offered the option of an antipsychotic medication and later reported relief of her fear but continued to have the visions. Although the information gathered indicated that she met the diagnostic criteria for bulimia nervosa after the first visit, the diagnosis of an eating disorder was not introduced until the fifth visit. It was felt that presenting this diagnosis could interfere with forming a therapeutic

Box 2. Construction of the formulation and generation of a treatment plan: case example

The patient is a 17-year-old girl who lives with her mother and stepfather. She was referred by her primary care physician for evaluation of new onset visual hallucinations and worsening depression. She has had intractable vomiting with a 25-pound weight loss after a viral illness 6 months ago; no explanation has been found despite repeated diagnostic procedures. She also has a history of multiple other medical symptoms and pain without identified causes. The patient's main concern is her worsening depression, whereas the mother's main concern is her vomiting. A possible precipitating event concurrent with the onset of vomiting was that the patient had a significant conflict with her biologic father and decided to end contact with him.

The patient has been home-schooled for the past 5 years because she was underperforming academically, although psychological testing revealed no cognitive deficits. This situation has led to some social isolation. Currently, her mother closely monitors and keeps records of her medical symptoms, and the two spend much of their time together. Mental status examination reveals a normal appearing but thin young woman with significant depressive symptoms; her ''visions'' are more consistent with anxiety than psychotic hallucinations. Her sense of self-worth is linked to her appearance, particularly of thinness. She feels she has no friends and is not secure about her relationship with her mother. She finds it difficult to verbalize her emotions and seems to use somatization as a vehicle for emotional expression.

The patient has several biologic risks for psychiatric difficulties, including being exposed in utero to psychotropic medications, likely including alcohol. She seems to have an anxious temperament, which was likely exacerbated by an insecure attachment related to her mother's emotional unavailability during her infancy when the parents' marriage ended and her mother began a new relationship with the patient's stepfather. Psychologically, she had difficulty with affect modulation in infancy, which has persisted. She is highly reactive to interpersonal slights and subsequently has not been able to form trusting relationships with adults or peers. Her sense of self-worth seems to be invested in her appearance, which puts her at risk for an eating disorder.

Her medical symptoms have particular significance within the mother-child relationship and seem to serve the function of engaging her mother's attention. Her mother oscillates between being overly attentive to her daughter's medical systems and being unattuned to her psychological needs and desire for autonomy. There is a secondary gain to the daughter's medical complaints because they elicit the mother's attention and prevent the mother from leaving the house, thereby maintaining the mother-daughter enmeshment. In addition to somatization, she uses the defense mechanisms of displacement (onto her body), isolation of affect, repression of anger, and some psychotic distortion of reality to cope with conflicted emotions and distressing affects. Psychodynamically, the patient seems to need to be ill or mirror her mother's medically oriented perception of her problems to stay connected to her mother. Socioculturally, her family is religious and has concerns about her acceptance of their value system. Currently the patient's functioning is impaired in all her major life roles, including academic, peer relationships, and behavior in the family setting.

The patient also has notable adaptive interests and capacities. Lately, she has been learning to drive and expresses interest in spending time with people her age. She is an attractive young lady who expresses interest in making changes in the way she approaches life. These motivations, if supported by her mother, could help her to relinquish her physical symptoms. It is unclear, however, whether the closeness of the patient and her mother currently based on her medical symptoms can shift to a healthy adolescent separation-individuation process.

Diagnostically, she meets criteria for major depressive disorder with possible psychotic features, bulimia nervosa, and somatoform disorder not otherwise specified. The problems to address in treatment include her depressive and anxiety symptoms, her vomiting, her social isolation, and psychological barriers in mother and daughter to the daughter's normative adolescent separation-individuation process. The treatment plan includes (1) pharmacotherapy with an antidepressant and short-term use of an atypical antipsychotic, (2) individual psychotherapy with supportive and cognitive-behavioral components to help the patient develop more adaptive ways to express psychological needs and conflicts and advance toward normative age-appropriate goals, and (3) family

therapy to help the mother-daughter relationship support the daughter's age-appropriate separation-individuation. The initial goal of family therapy would be to develop a constructive alliance with the parents, which requires respect and validation of their goals and values and their concerns about the daughter's ability to handle more autonomy.

alliance with the mother and patient, because they were very invested in other medical explanations. When it was presented, the patient's mother was reluctant to accept this diagnosis and continued to insist that the patient was vomiting because of a medical reason that had not been identified. The mother became distraught when family therapy was recommended and insisted that treating her daughter's depression would lead to an improvement of her appetite and resolve the vomiting. The patient did report dramatic improvement in her energy when her antidepressant dose was increased. She was continuing to "spit up" in the middle of the night but had not vomited in 2 weeks. They continued to come for weekly appointments.

Additions made after the case was discussed in supervision

The patient has several biologic risks for psychiatric difficulties, including a history of being exposed in utero to psychotropic medications, likely including alcohol. She seems to have an anxious temperament, which was likely exacerbated by an insecure attachment related to her mother's emotional unavailability during her infancy when the parents' marriage ended and her mother began a new relationship with the patient's stepfather. Psychologically, the history suggests that the patient had difficulty with affect modulation in infancy, which continued through her childhood. She is highly reactive to interpersonal slights and subsequently has not been able to form trusting relationships with adults or peers. Her sense of self-worth seems to be invested in her appearance and the desire to change her weight, which increases her risk of developing an eating disorder.

The patient also had developmental problems that manifested in academic problems in elementary school 4 years ago. After an unrevealing educational assessment, she was home-schooled, which further limited her opportunities to develop peer relationships. In the past 5 years she endured multiple medical evaluations and procedures and four hospitalizations for medical problems, which further interfered with her schooling. She is not able to verbalize her anger, and her vomiting seems to correlate with emotional distress in place of verbal expression.

Her medical symptoms seem to have particular significance within the mother-child relationship and seem to serve the function of engaging her mother's attention. Her mother's response to her oscillates between being overly involved and attentive to her medical symptoms and being

unsupportive regarding her psychological vulnerabilities and desire for autonomy. She emphasizes medication as a solution to psychological problems, which minimizes the importance of her own and the patient's psychological involvement in the treatment process. There is a secondary gain to the daughter's medical complaints because they elicit the mother's attention and prevent the mother from leaving the house, thereby continuing the mother-daughter enmeshment.

In addition to somatization, she uses the defense mechanisms of displacement (onto her body), isolation of affect, repression of anger, and reaction formation to cope with conflicted emotions and distressing affects. The patient's comment that she never felt "connected" to her mother suggests that the use of somatization is associated with what Winnicott referred to as a "false self" [29] incorporating the need to be ill or mirror her mother's symptom-oriented perception of problems to stay connected to her mother. At times, she also uses the defense of psychotic distortion of reality. Another possible contributor to her anxiety, affective, and psychotic-like symptoms could be trauma related to multiple invasive medical procedures or possible physical abuse as a child.

Alongside these constitutional and psychological vulnerabilities, the patient also has some adaptive interests and capacities. Lately, she has been learning to drive and started expressing interest in spending time with people her age. She is an attractive young lady who expresses interest in making changes in the way she approaches life. These motivations, if supported by her mother, could help her to relinquish some of her physical symptoms. It is unclear, however, whether the closeness of the patient and her mother currently based on her medical symptoms can shift to a healthy adolescent separation-individuation process. The treatment plan includes individual psychotherapy with supportive and cognitive-behavioral components to help the patient develop more adaptive ways to express psychological needs and conflicts and help her advance toward normative age-appropriate goals. Family therapy has been recommended to help support the mother and daughter to reconfigure their emotional involvement to support age-appropriate separation-individuation. The mother's need for the daughter to remain dependent by being medically ill may be difficult to address without the mother receiving her own individual therapy, however.

The resident used the Defensive Functioning Scale in the DSM-IV-TR [30] to consider the patient's symptoms in terms of their defensive functions. The addition of an expanded psychodynamic formulation helped the resident more fully understand the patient's extreme dilemma. Her desire for age-appropriate autonomy was directly in conflict with her ongoing need to repair a historically weak emotional connection with her mother. Relinquishing her physical symptoms would require her mother's willingness to work to accept a less enmeshed form of relatedness with her daughter, with the attendant psychological risk (for both of them) of her daughter feeling free enough to develop other intimate relationships.

After developing the expanded case formulation, the resident felt she was working more successfully to help the daughter develop age-appropriate interests and greater autonomy. The last part of this evolving formulation occurred when she received a letter from the mother indicating her intention to end the treatment because her daughter was becoming more disobedient at home and not embracing the values of the family. In debriefing with the supervisor, additional information was shared and integrated into the formulation—that the patient's mother had become emancipated as a teenager because of a difficult family situation. With her own potentially unresolved adolescent separation, helping her daughter navigate these challenges would understandably generate internal conflict. By reviewing the case formulation and its prediction of obstacles, the resident understood that an earlier formulation of the mother's dilemma would have helped her work more effectively with both partners. She recognized that it would have been helpful to put more therapeutic time into working directly with the mother and stepfather to fully understand their goals and develop a collaborative formulation and treatment plan.

Summary

Case formulation plays a central role in guiding treatment planning in child and adolescent psychiatry. It helps synthesize many complex factors into hypotheses about the cause of the problem. This comprehensive, individualized picture helps to translate the diagnosis into the choice of where to put therapeutic resources at a particular stage of treatment. The biopsychosocial approach to formulation is the most comprehensive and facilitates the clinician's attention to all the major domains. The case formulation is an ongoing and dynamic process, an evolving "story" or narrative that is modified as more information is added. Because children must be seen in the context of their families, schools, neighborhoods, and larger ecology, the case formulation in child and adolescent psychiatry is more contextual and relies on multiple perspectives gleaned from a lengthier interview process. In general, case formulation has not been taught extensively in psychiatric residency programs, and even experienced clinicians do not routinely construct comprehensive case formulations. Most clinicians agree that more time should be spent teaching and modeling construction of the formulation in didactics, supervision, and case conferences. Including the child and family in the construction and ongoing revision of the formulation and addressing their strengths and needs—not just problems or pathology—promotes the therapeutic alliance. Integration of multiple theoretical and explanatory perspectives can be useful in teaching and applying the case formulation process. Clinical examples in the article illustrate aspects of the case formulation and residents' use of supervision to develop more elaborated and comprehensive case formulations.

References

[1] McClain T, O'sullivan PS, Clardy JA. Biopsychosocial formulation: recognizing educational shortcomings. Acad Psychiatry 2004;28(2):88–94.

[2] Connor DF, Fisher SG. An interactional model of child and adolescent mental health clinical case formulation. Clin Child Psychol Psychiatry 1997;2(3):353–68.

[3] Bergner RM. Characteristics of optimal clinical case formulations. Am J Psychother 1998; 52(3):287–300.

[4] Nurcombe B, Fitzhenry-Coor I. Diagnostic reasoning and treatment planning: I. Diagnosis. Aust N Z J Psychiatry 1987;21(4):277–83.

[5] Kassaw K, Gabbard GO. Creating a psychodynamic formulation from a clinical evaluation. Am J Psychiatry 2002;159(5):721–6.

[6] Perry S, Cooper AM, Michels R. The psychodynamic formulation: its purpose, structure, and clinical application. Am J Psychiatry 1987;144(5):543–50.

[7] Shapiro T. The psychodynamic formulation in child and adolescent psychiatry. J Am Acad Child Adolesc Psychiatry 1989;28(5):675–80.

[8] Eells TD, editor. Handbook of psychotherapy case formulation. New York: Guilford Press; 1997.

[9] Engel GL. The clinical application of the biopsychosocial model. Am J Psychiatry 1980; 137(5):535–44.

[10] Nurcombe B, Drell M, Leonard H, et al. Clinical problem solving: the case of Matthew, part 1. J Am Acad Child Adolesc Psychiatry 2002;41(1):92–7.

[11] Engel GL. From biomedical to biopsychosocial: being scientific in the human domain. Psychosomatics 1997;38(6):521–8.

[12] American Psychiatric Association Commission on Psychotherapy. Definition of the biopsychosocial formulation. Washington, DC: American Psychiatric Association; 1996.

[13] Mellman L, Beresin E. Psychotherapy competencies: development and implementation. Acad Psychiatry 2003;27(3):149–53.

[14] Novins D, Bechtold DW, Sack WH, et al. The DSM-IV outline for cultural formulation: a critical demonstration with American Indian children. J Am Acad Child Adolesc Psychiatry 1997;36:1244–51.

[15] Jellinek MS, McDermott JF. Formulation: putting the diagnosis into a therapeutic context and treatment plan. J Am Acad Child Adolesc Psychiatry 2004;43(4):913–6.

[16] Turkat ID. The personality disorders: a psychological approach to clinical management. New York: Pergamon; 1990.

[17] Storck M, Vanderstoep A. Fostering ecological perspectives in child psychiatry. Child Adolesc Psychiatr Clin N Am 2007;16(1):in press.

[18] Lane D. Context focused analysis: an experimentally derived model for working with complex problems with children, adolescents and systems. In: Bruch M, Bond FW, editors. Beyond diagnosis: case formulation approaches in CBT. West Sussex, England: John Wiley & Sons, Ltd.; 2003. p. 103–40.

[19] Metz P. The child psychiatric formulation: process and content considerations from a systems-based perspective. Presented at the Annual Meeting of the American Academy of Child and Adolescent Psychiatry. Toronto, October 24, 2005.

[20] Winters NC, Pumariega AJ, American Academy of Child and Adolescent Psychiatry Work Group on Quality Issues. Practice parameter on child and adolescent mental health care in community systems of care. J Am Acad Child Adolesc Psychiatry, in press.

[21] Bruch M, Bond FW. Beyond diagnosis: case formulation approaches in CBT. New York: Wiley & Sons; 1998.

[22] McWilliams N. Psychoanalytic case formulation. New York: Guilford Press; 1999.

[23] Mellman L. The psychodynamic formulation. Presented at the annual meeting of the American Association of Directors of Psychiatric Residency Training (AADPRT), March 9, 2002.

[24] Beck A. The current state of cognitive therapy: a 40-year retrospective. Arch Gen Psychiatry 2005;62:953–9.
[25] Sudak D, Beck J, Wright J. Cognitive behavioral therapy: a blueprint for attaining and assessing psychiatry resident competency. Acad Psychiatry 2003;27:154–259.
[26] Winters NC, Hanson G, Colman L, et al. Integrated teaching of psychodynamic and evidence-based psychotherapies in child psychiatry. Presented at the Annual Meeting of the American Association of Directors of Psychiatric Residency Training. San Diego, March 10, 2006.
[27] Barker P. The child and adolescent psychiatry evaluation: basic child psychiatry. Oxford, UK: Blackwell Scientific, Inc.; 1995.
[28] Nurcombe B. Developmental psychopathology and the diagnostic formulation. Presented at the Annual Meeting of the American Academy of Child and Adolescent Psychiatry. Washington, DC; October 1992.
[29] Winnicott DW. The maturational process and the facilitating environment. New York: International Universities Press; 1965.
[30] American Psychiatric Association. Diagnostic and statistical manual of mental disorder. 4th edition. Washington, DC: American Psychiatric Association; 2000. p. 807–13.