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Attention-deficit hyperactivity disorders

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Attention-deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral disorder of childhood. It is highly comorbid with other disorders, such as oppositional defiant disorder, conduct disorder, mood disorders, anxiety disorders, Tourette's disorder, chronic tic disorders, learning disorders, and substance abuse in adolescents [1,2]. Essential features of ADHD include a persistent pattern of inattention or hyperactivity-impulsivity or both that are more frequent and severe than typically observed in individuals at a comparable level of development [1]. ADHD is the most frequently diagnosed behavioral disorder in children and adolescents, with the prevalence estimated to range from 4% to 12% of the population [1,3]. Among children, the gender ratio is 3:1 boys to girls, and among adults, the gender ratio is 2:1 or lower. It seems that more females than males have the inattentive subtype.

ADHD is prevalent in every country in which it has been investigated. It is acknowledged to be a specific developmental disorder that continues into adulthood, comprising deficits in behavioral inhibition, sustained attention and resistance to distraction, and the regulation of one activity level to the demands of a situation (hyperactivity or restlessness) [1,4]. The subtypes include combined type (inattention plus hyperactivity-impulsivity), inattentive type, and hyperactivity-impulsive type. Although the term *attention-deficit disorder* sometimes is used to describe this diagnosis, the correct term is *attention-deficit/hyperactivity disorder*. It is a myth that attention-deficit disorder is different from ADHD or that if a child is not "hyperactive," he or she does not have ADHD. Children are not being "overdiagnosed" or "overmedicated" for ADHD [4–6].

The prevalence of and potential disabling effects of ADHD are major concerns for patients, caregivers, health care providers, and communities. This article discusses core features of attention-deficit disorders and salient

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points associated with causative factors. The role of the nurse in assessment and treatment planning also is discussed.

Core features

The *Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision* (DSM IV-TR) [1] delineates the two core features of ADHD as inattention and hyperactivity-impulsivity. Symptoms must persist for at least 6 months, be observed before age 7, and produce considerable global functional disturbances. This disorder is also likely to result in the following behaviors:

1. Impaired response inhibition, impulse control, or the capacity to delay gratification
2. Excessive task-irrelevant activity of activity poorly regulated to the demands of a situation (''on the go'')
3. Poor sustained attention or persistence of effort to tasks. Individuals have difficulty with tedious or protracted tasks, completing routine assignments. and working independently.
4. Difficulty remembering to do things or poor working memory
5. Delayed development of internal language (the mind's voice) and rule following
6. Difficulties with regulation of emotions, motivation, and arousal
7. Diminished problem-solving ability, ingenuity, and flexibility in pursuing long-term goals
8. Greater than normal variability in task or work performance [1,4,7]

Causative factors

The underlying cause of ADHD is obscure, although there is growing evidence that links it with biologic, genetic, neuroanatomic, and environmental factors. Enormous progress continues to be made concerning the cause of ADHD. Most data point to strong neurobiologic and genetic correlates. Neurobiologic theories include dysregulation of complex biochemical processes involving dopaminergic and noradrenergic systems. Specifically, pharmacologic studies indicate the efficacy of psychostimulants and modulation of certain dopamine systems. Additional studies implicate alterations in dopamine systems in the role of persistence, distractibility, motivation, and motor control [8]. Inadequate modulation or overactivity of norepinephrine systems seems to result in hyperactivity and inattentiveness, core features of ADHD. Other behavioral manifestations of these biologic underpinning include cognitive disturbances that affect concentration, arousal, and motivation [9].

Compelling research supports the role of genetic and familial patterns in ADHD. Twin studies indicate that the heritability of ADHD ranges from

64% to 77% and that inattentive behaviors range from 76% to 98%. These data strongly suggest genetic predisposition as a cause of ADHD [1].

Neuroimaging studies indicate reduced profusion in frontal lobe and basal ganglia regions that contribute to self-regulation disturbances in children with ADHD. Data also show structural alterations that are consistent in children and their parents, further strengthening support of the role of genetics and familial influences [2].

Environmental factors associated with ADHD include complications from pregnancy and the delivery process, including traumatic brain injury and low birth weight. Other possible causes include various agents that can lead to brain injury or abnormal brain development, such as trauma, disease, fetal exposure to alcohol and tobacco, and early exposure to high levels of lead and diminished activity in certain brain regions [1,4,6,10].

Nurses working with patients with ADHD and their caregivers must be able to integrate basic biologic factors into the assessment process and treatment planning. Of particular importance are recognizing behaviors that reflect altered neurobiologic processes; determining appropriate interventions; and educating the patient and caregivers about this common, chronic, and disabling mental disorder. Diagnosis of ADHD requires a systematic data collection from various sources, including the patient, caregivers or family members, teachers, and employers.

Diagnosis, assessment, and evaluation

The assessment process begins with identification of core features of ADHD—inattention, hyperactivity, and impulsivity—to meet DSM IV-TR [1] criteria. Verbal narratives, written narratives, questionnaires, or rating scales are essential, and the use of global clinical impressions or general descriptions within domains of attention and activity is insufficient to diagnose ADHD.

Systematic data collection from various sources often begins with the parent interview. ADHD is a clinical diagnosis with no ''ADHD test.'' Interviewing the child alone is not sufficient because children lack insight into their behaviors. It is essential to glean data and necessary to use direct information from multiple informants, such as teacher report forms, report cards, attendance records, and information from coaches and other significant adults [10,11]. Because of the high comorbidity of other psychiatric disorders and possible physical causes of ADHD, it is imperative that the nurse participate in making a differential diagnosis of these conditions. See Table 1 for conditions that may mimic symptoms of this ADHD.

Other assessment tools include rating scales and information from academic and employment function. Rating scales are an important component of the assessment and may be used by therapists and other mental health professionals making a differential diagnosis of ADHD. Barkley's [4] checklists and rating scales are used widely to make a correct diagnosis

Table 1
Differential diagnostic categories of attention-deficit/hyperactivity disorder

General medical conditions	Neurologic conditions	Psychiatric conditions	Environmental factors
Hearing impairment	Learning disability*	Oppositional defiant disorder	Improper learning environment (unsafe, disruptive)*
Visual impairment	Tic disorder	Conduct disorder	Mismatch of school curriculum with child's ability (gifted, learning disabled)
Medication effects (eg, antihistamine decongestants, β-agonists, anticonvulsants)	Seizure disorder	Substance abuse*	Family dysfunction or stressful home environment*
	Mental retardation (fetal alcohol syndrome, fragile X syndrome, phenylketonuria)	Anxiety*	Poor parenting (inappropriate, inconsistent, punitive)*
		Depression*	Child neglect or abuse*
		Obsessive-compulsive disorder*	Parental psychopathology*
Asthma	Developmental delays	Posttraumatic stress disorder	
Allergic rhinitis	Brain injury†		
Eczema	Sleep disorders		
Enuresis*			
Encopresis			
Malnutrition			
Hypothyroidism			
Lead toxicity			

* Common comorbid and associated conditions [8].

† Children with ADHD also are more likely to experience traumatic brain injury, and children with head injuries may develop a "secondary" ADHD.

and guide behavioral and psychosocial planning. Other tools include the Achenbach Child Behavior Checklist and the Conners Abbreviated Teacher Rating Scale. Structured behavioral observations in naturalistic and other settings are helpful in measuring medication response and yielding data regarding the teacher's management style.

As previously noted, the assessment process must be systematic and comprehensive and include data from many sources. Initially the nurse may gather data from parents or caregivers regarding the core symptoms of ADHD in various settings, the age of onset, duration of symptoms, and degree of functional impairment. It is also necessary to obtain evidence directly from the classroom teacher about core symptoms, duration, impairment, and coexisting conditions. The American Academy of Pediatrics recommends that physicians review these reports, which should include verbal narratives, written narratives, questionnaires, or rating scales. Teachers are not licensed or educated, however, to make a diagnosis of ADHD, and they may not make a recommendation that a child receive treatment—medicine or other treatment—for ADHD [6,12].

Course of attention-deficit/hyperactivity disorder

Historically, ADHD was thought to be a childhood disorder that affected the child and family. More recent studies indicate that the developmental risk associated with ADHD, particularly between hyperactive and conduct problems, increases the likelihood of psychiatric disorders. Impaired social functioning, independent of conduct-related problems, seems to increase the likelihood of psychiatric conditions, persisting hyperactivity, violent and antisocial behaviors, and social and interpersonal relationship problems later in life [9]. More than 70% of hyperactive children continue to meet criteria for ADHD during adolescence, and 65% of teens may continue to meet the criteria for this disorder in adulthood.

Common adult behaviors associated with ADHD [13] include the following:

- Inability to relax—motor hyperactivity
- Attention deficits—easily distracted, difficulty maintaining concentrations on activities, such as reading
- Affective lability—dating back to adolescence (ie, boredom, depressed)
- Hot temper, explosive behaviors—"short fuse," "easily rattled"
- Overreactivity—inappropriate expression of anger, "stressed out"
- Disorganization—poor time management skills
- Impulsive behaviors—using poor judgment, such as speaking before thinking about consequences
- Interpersonal, academic, and occupational disturbances

As a result of these maladaptive behaviors, adults with ADHD are likely to be undereducated relative to their intellectual ability and family

educational background. They experience difficulties with work adjustment and may be underemployed in their occupations relative to their intelligence and educational and family backgrounds. They experience problems resulting from procrastination, lack of productivity, and disorganization. They have a tendency to be scattered and have poor time management. The impulsive blurting that is characteristic of the disorder is often unsuitable to appropriate workplace behavior. They "tune out" during instructional situations, on-the-job training sessions, or meetings and have difficulty following instructions. Their time management is poor. The ADHD employee makes piles of materials and files and has difficulty finding things. They have trouble staying put; they wander around the workplace and intrude on others who are trying to work, creating stress on other people. They are likely to be fired and tend to change their jobs more often because of boredom or interpersonal problems. They have a greater turnover of friendships and dating relationships and seem more prone to marital discord and divorce. ADHD adults have difficulties with traffic violations and resultant accidents and the prospect of license suspension. Adults with ADHD are eligible for accommodations in their workplace or educational settings under the Americans with Disabilities Act, provided that the severity of the ADHD is such that it produces impairments in one or more major areas of life functioning and that they disclose their disorder to their employer or educational institution [4,12].

Treatment considerations

No treatments have been found to cure ADHD, but an array of therapeutic interventions exist that can manage this complex disorder effectively. It is well documented that the most effective treatment approach is holistic and comprehensive and integrates pharmacologic and psychotherapeutic interventions. Primary treatment goals include reducing inattentiveness, hyperactivity, and impulsivity and improving psychosocial and academic performance, with minimal adverse reactions from treatment.

Pharmacotherapy

Compelling evidence indicates the efficacy of pharmacotherapy strategies for youths who meet criteria for ADHD [20]. The most effective treatment involves stimulant medications [8,14]. The most commonly used stimulants are methylphenidate (Ritalin), dextroamphetamine (Dexedrine), and an amphetamine mixture (Adderall). Psychostimulants have been shown to be effective in improving behavior, academic performance, and social adjustment (50% to 95% of children with ADHD) [2]. The efficacy of these agents lies in the ability to increase the availability of dopamine, enhancing attention. Other stimulants, such as pemoline (Cylert) and methamphetamine, are not as widely used because of liver toxicity and because of abuse potential [2].

The efficacy of these agents is their ability to produce a paradoxical calming and mental focusing at low doses and reduction of hyperactive motor movements at higher stimulant doses among patients diagnosed with the disorder as opposed to normal subjects. Another difference is that there is little or no evidence of "reverse tolerance" or sensitization seen in amphetamine or cocaine abusers. Psychostimulants are classified as *cognitive enhancers* and have been shown to be safe and efficacious in the treatment of school-age children and are considered the drug of choice for the treatment of ADHD. Research indicates that stimulant medications and desipramine improve core symptoms more effectively than placebo and that currently available stimulants have equal efficacy and may improve core ADHD symptoms in 80% of properly diagnosed children [8,15]. Stimulant medicines do not improve antisocial behavior, reading skills, or academic achievement [2,5,15,16].

Although stimulants as a rule have a safe side-effect profile, they can produce adverse side effects. Adverse effects include insomnia, decreased appetite, stomach pain, headache, worsening of tics, decreased growth velocity, tachycardia, blood pressure elevation rebound or deterioration when medication wears off, emotional lability, irritability, social withdrawal, and flattened affect [8]. Nursing implications for patients taking stimulants include obtaining an informed consent, providing health education, and gathering baseline information concerning the patient's mental and physical status. Height and weight; diagnostic laboratory studies, including liver enzymes; and vital signs are crucial to monitoring for adverse side effects. In the case of using other drugs that are cardiotoxic, such as desipramine, an electrocardiogram is necessary as baseline and periodic monitoring throughout treatment.

The decision to medicate is based on the presence of a diagnosis of ADHD and persistent target symptoms that are sufficiently severe to cause functional impairment at school and usually at home and with peers. Baseline behavioral and school data must be obtained before beginning medication trial. It is a myth that most children with ADHD are receiving medication for the condition; evidence indicates that less than one in eight children with ADHD take medications. Research indicates that primary care physicians do more than 85% of the prescribing for this disorder; only 3% receive treatment from a psychiatrist [5,16].

Normally, stimulants are ordered on a specified schedule. Stimulant medication is initiated with a low dose and titrated weekly according to patient response and side-effect profile. Beginning with a morning dose enables comparison of morning and afternoon performance. The afternoon dose should be initiated based on severity of symptoms plus time course. After-school dosing enables homework performance without sacrificing sleep latency [5,16].

Health education must spell out explicitly benefits and adverse side effects and symptoms that require immediate medical attention. Information about

when to take the medication and monitoring of the patient's appetite and sleeping patterns must be explained to caregivers.

Other medications found efficacious in ADHD are antidepressants and clonidine. Antidepressants commonly used with ADHD are desipramine, imipramine (Tofranil), amitriptyline (Elavil), and fluoxetine (Prozac). Although these medications were developed to treat depression, they also are used for enuresis, panic, anxiety, and sleep problems. The mechanism of action of antidepressants in the child with ADHD is in increasing the neurotransmitters norepinephrine and dopamine, especially in the frontal area, as do the stimulants. They are useful when the ADHD child has not shown a good response to the stimulants, cannot tolerate taking a stimulant, or has depression or anxiety in addition to ADHD [7]. They sometimes are combined with stimulants, especially for children with comorbid depression. Doses are 1 to 5 mg/kg/d. Children taking tricyclic antidepressants must have baseline and periodic ECGs due to cardiotoxic properties of TCAs. Tolerance may be built up so that often the child cannot take them for longer than 24 months and may need to be tapered for a few months then restarted. Fluoxetine is helpful for children with associated mood disorders and is beneficial in reducing aggressive behavior. It is a safe drug in children, especially children who have abnormal heartbeats or arrhythmia. Fluoxetine is started with a dose of 2.5 to 5 mg once daily and raised by 2.5 mg per week until a positive response is noted. A careful history of other medications must be taken to avoid medication interactions, especially with monoamine oxidase inhibitors [7].

Clonidine reduces motor hyperactivity and impulsiveness and may reduce aggressive tendencies and overarousal. It is suited best for patients with comorbid oppositional, defiant, and conduct disorders. Side effects include fatigue or somnolence, mild hypotension, and slightly decreased heart weight. This medication should never be discontinued abruptly and may interact with other medications. It is started slowly (0.05 mg at bedtime) and increased gradually to four times per day with one of the doses 1 mg [7]. Mood stabilizers and atypical antipsychotics may be helpful in patients who fail to have adequate responses to stimulants, α_2-adrenergic agonists, or bupropion, especially if they are misdiagnosed bipolar disorder patients or have comorbid bipolar disorder [9]. Strattera (Atomoxetive HCL) is the first FDA-approved, non-stimulant, noncontrolled medicine for ADHD. Released on January 14, 2003, the dosage ranges from 18 mg–25 mg for children 40–62 lbs, up to 40–80 mg for children above 127 lbs [17]. Adults with ADHD also can benefit from pharmacologic therapies discussed in this section [20].

Psychotherapeutic interventions

Comprehensive treatment planning must be holistic and individualized to meet the needs of the patient, caregivers, and family members. Combined therapies often yield the best results for reduction in symptoms

over medication alone, behavioral treatment alone, or community care [5,8]. Behavioral training benefits to families cannot be distinguished from providing information and general attention, however, and there is no current evidence to substantiate the benefit of behavioral therapies over information and attention [14].

Psychosocial interventions

Psychosocial interventions include helping the child with ADHD gain social skills and more satisfying interactions with peers and family members. Team sports, scouting, and church and community activities are valuable in promoting self-esteem and improving positive relationships with peers and others. Individual therapy and family therapy may be useful, especially for the child with comorbid conditions [8]. These interventions are not a substitute for medication management. It is essential for the parents to comprehend fully the biologic nature of the disorder to help the child. The ADHD adult may require counseling about his or her condition, vocational assessment and counseling to find the most suitable work environment, time management and organizational assistance, and other suggestions for coping with the disorder. Spouses may benefit from learning about the disorder as well [4,10,20].

Nurses provide an array of psychotherapeutic interventions. Depending on the nurse's educational preparation and clinical expertise, the nurse is likely to play key roles in health education, monitoring the effects of medications, crisis intervention, and providing various psychotherapies that assist the patient in improving coping and social skills.

Behavioral interventions

Behavioral interventions are used to identify and provide positive reinforcement of adaptive coping behaviors to reduce problem behaviors. They are most effective when parents and teachers focus on a limited number of specific behaviors and the environmental conditions that elicit them [4,8,18]. Effective parental management strategies for parenting the ADHD child have been promulgated by Barkley [4,7] and supported by parent support associations, such as Children and Adults with Attention Deficit Disorders (CHADD) and Attention Deficit Disorder Association (ADDA). Suggested strategies that promote parental management of difficult behaviors include the following:

1. Give the child more immediate feedback and consequences: Positive feedback is given promptly with verbal praise, and negative feedback and consequences are given with specifics as to what the child has done wrong.
2. Give the child frequent feedback (eg, for staying on task during homework).

3. Use larger and more powerful consequences to develop and maintain positive behaviors.
4. Use incentives before punishment.
5. Strive for consistency—being consistent over time, not giving up too soon, being consistent in various settings, maintaining a united parental front.
6. Act; don't talk.
7. Plan ahead for problem situations by doing the following: Stop before entering a problem situation, review the rules in that situation and ask the child to repeat the rules, set up the reward or incentive, explain the punishment, and follow the plan.
8. Keep a disability perspective.
9. Do not personalize the problems or disorder.
10. Practice forgiveness—let go of bitterness over the child's difficult behavior, forgive others, and forgive yourself [7].

It is imperative for the nurse to develop an individualized health education program for parents, caregivers, and family members about the disorder of ADHD to understand and have reasonable and realistic expectations. Other management strategies include establishing house rules, routines, and schedules; being specific about behavioral expectations; scheduling time with the child; making frequent eye contact during communication with the child; focusing on the child's strengths; and picking battles carefully. The daily school report card is an educational and behavioral intervention for helping the ADHD child. Examples of daily report cards are found in the Barkley manual [4,18]. The advantage of these report cards include giving the child immediate feedback, helping the parent see trends and changes in behavior, and determining rewards and consequences.

Family therapy also may be indicated in the treatment of ADHD. When the family system is disorganized or chaotic, it is essential for the mental health clinician to involve the family and parents in family therapy and parenting classes. Treatment of Axis I disorders in the parents may be helpful. Parents may benefit from earning negotiation, problem solving, and contingency contracting [19].

Academic interventions

Academic interventions maximize the likelihood of the child's academic success by developing areas of strength, adapting to special needs, and remediating knowledge and skill deficits. Schools are legally responsible for determining whether the child can meet criteria for special services, such as tutoring or adaptation of educational methods, and ensuring that these services are provided. The Individuals with Disabilities Education Act and Section 504 of the Rehabilitation Act of 1973 provide coverage for children with ADHD. When the disability adversely affects educational performance, eligibility for special education should be approached through the

Individuals with Disabilities Education Act. When the disability does not affect educational performance but limits one or more major life activities, eligibility is through Section 504.

Most experts recognize that teachers play an important role in assisting the ADHD child to succeed. It is essential for parents and teachers to work closely together. Daily report cards are an example of this type of close communication and cooperation. The effectiveness of the report card program depends on the teacher accurately evaluating the child's behavior and the consistent use of fair and consistent consequences at home. Children are not adequate or appropriate self-reporters of behavior at school. Missing or absent report cards should be treated the same as a "bad" report. The teacher rates the children using a 5-point system (1 = excellent; 2 = good; 3 = fair; 4 = poor; 5 = very poor). Teachers are encouraged to write a brief summary for particularly negative behavior [4,8].

Summary

ADHD is a complex disorder affecting all areas of the patient's life. There are many myths about the disorder, which have to be denounced to enable proper diagnosis and treatment. This lifelong disorder challenges in nurses in various practice settings to understand the basis of ADHD, analyze symptoms, and implement holistic treatment planning. Nurses play key roles in the data collection process, treatment planning, and working with the patient in the community and school systems. Health education is a strong component of comprehensive treatment planning, and nurses are in pivotal positions to provide a host of interventions that facilitate optimal function and quality of life.

References

[1] American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th edition text revision. Washington, DC: American Psychiatric Association; 2000.
[2] Wender PH. Adult manifestations of attention-deficit/hyperactivity disorder. In: Sadock BJ, Sadock VA, editors. Comprehensive textbook of psychiatry. 7th edition. Philadelphia: Lippincott Williams & Wilkins; 2000. p. 2688–92.
[3] Joughin C, Zwi M, Ramchandani P. Attention deficit hyperactivity disorder in children. Clinical Evidence 2001;6:234–42.
[4] Barkley RA. Attention-deficit hyperactivity disorder: a clinical workbook. 2nd edition. New York: Guilford Press; 1998.
[5] Jensen PS. Introduction: ADHD comorbidity and treatment outcomes in the MTA. J Am Acad Child Adolesc Psychiatry 2001;40:134–8.
[6] Selekman J. 100 years of attention deficit hyperactivity disorder: debunking the myths. Pediatr Nurs 2002;28:79–83.
[7] Barkley RA. Taking charge of ADHD: the complete, authoritative guide for parents. New York: Guilford Press; 1995.
[8] Smucker WD, Hedayat M. Evaluation and treatment of ADHD. Am Family Physician 2001;64:817–30.

[9] Stahl S. Essential psychopharmacology. 2nd edition. Cambridge: Cambridge University Press; 2000.
[10] Hollowell EM, Ratey JJ. Driven to distraction. New York: Touchstone; 1994.
[11] Krueger M, Kendall J. Descriptions of self: an exploratory study of adolescents with ADHD. J Child Adolesc Psychiatr Nurs 2001;14:61–74.
[12] Homer CJ, Lowe B, Perrin J, et al. Clinical practice guideline: diagnosis and evaluation of the child with attention-deficit/hyperactivity disorder. Pediatrics 2000;105:1158–80.
[13] Wilens TE, Biederman J, Brown S, et al. Psychiatric comorbidity and functioning in clinically referred preschool children and school-aged youths with ADHD. J Am Acad Child Adolesc Psychiatry 2002;41:262–8.
[14] Barkley A. Commentary on the multimodal treatment study of children with ADHD. J Abnorm Child Psychol 2000;28:595–602.
[15] Reiff MI, Sandler AD. ADHD and pharmacotherapy. J Dev Behav Pediatr 2002;23:120–3.
[16] Jensen PS, Kettle L, Roper MT, et al. Are stimulants overprescribed? Treatment of ADHD in four U.S. communities. J Am Acad Child Adolesc Psychiatry 1999;38:797–807.
[17] Lilly launches new era in attention-deficit/hyperactivity disorder treatment with first FD4-approved non-stimulant medication. Available at: http://www.newsroom.lilly.com. Accessed January 14, 2003.
[18] Alexander-Roberts C. The ADHD parenting handbook. Dallas: Taylor Publishing Company; 1994.
[19] Zimmerman ML. Behavioral and emotional disorders of childhood and adolescence. In: Houseman C, editor. Psychiatric certification review guide for the generalist and clinical specialist in adult, child, and adolescent psychiatric and mental health nursing. 2nd edition. Potomac (MD): Health Leadership Associates; 1998.
[20] Finkel MF. The diagnosis and treatment of the adult attention deficit hyperactivity disorders. Neurologist 1997;3:31–44.