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ABSTRACT

Interviewed were 115 parents of children receiving medication for hyperactivity, convulsive disorders, or other reasons. Parents received a Children's Medication Chart (CMC) which contained life size pictures of 69 different products to aid parents in identifying medication. The telephone interview covered such aspects as frequency of administration, therapeutic response, side effects, physician referral, drug-free periods, and dosage. Among results were that the CMC was an effective research tool; that the most frequently prescribed drugs for hyperactive children are stimulants; that the most frequently prescribed drugs for children with convulsive disorders are Dilantin, phenobarbital, and Mysoline; and that side effects were reported by 46.2% of the parents for 47.3% of the drugs prescribed for hyperactive children, and 38.6% of the parents of children with convulsive disorders for 37.5% of the drugs. (CL)

PSYCHOTROPIC AND ANTICONVULSANT DRUG USAGE IN EARLY CHILDHOOD SPECIAL EDUCATION PROGRAMS III. A PRELIMINARY REPORT: PARENT INTERVIEWS ABOUT DRUG TREATMENT[1]

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The use of psychotropic drugs (stimulants, major and minor tranquilizers, hypnotics and sedatives, and antidepressants) for the management of learning and behavior problems in children has received considerable attention in recent years. Although a vast literature is available on this subject, especially hyperactivity (HA) (Conners, 1974; Eisenberg & Conners, 1971; Freeman, 1970; Ross & Ross, 1976; Safer & Allen, 1976; Sleator & Sprague, 1977; Sprague & Sleator, 1973, 1975; Sprague & Werry, 1971, 1974; Wender, 1971; Winchell, 1975), most of the data is from laboratory studies or statements about clinical experience from physicians who have treated large numbers of children. Very few studies have been conducted about how this therapeutic technique is implemented in natural settings by a number of different doctors, and the effect of this treatment modality on the child, family, and the school. Drug therapy is of interest to school personnel because it has a powerful effect upon behavior, large numbers of children are treated with medication for learning and behavior disorders (especially children in special education programs), and teachers can play a valuable role in drug treatment (Sprague & Gadow, 1976).

The use of these drugs with preschool children is particularly interesting because: (1) little research has been conducted on many of these drugs with this age group, (2) younger children may respond differently to drug treatment than older children or adults, and (3) many psychotropic drugs used with older children are not approved for use with children under six years of age for reasons of safety and efficacy. Because much emphasis has been placed on the importance of early intervention strategies for children with handicaps, developmental delays, and learning problems (Hunt, 1975; Jordan, Hayden, Karnes, & Wood, 1977), many cost-benefit questions may be raised about the role of drug treatment with children in early childhood special education programs (ECSE).

Anticonvulsant drugs are also receiving more attention in recent years about the effects of chronic toxicity (Reynolds, 1975) and their effect upon behavior, learning, and cognition (Crowther, 1967; Dekaban & Lehman, 1975; Reynolds, 1975; Stores, 1975), especially with young children (Dekaban & Lehman, 1975). Because a number of psychotropic drugs have anticonvulsant properties, e.g., Valium, many of the concerns about the effects of drug treatment for learning and behavior problems apply to children with convulsive disorders (CD).

HA and CD are similar because they are chronic disorders that typically respond to drug treatment and require long-term, closely monitored care. Also,

there are a number of similarities in the role of the school in drug treatment (Sprague & Gadow, 1976). Both HA and CD are considered primarily disorders of childhood and account for much of the long-term drug treatment with school age children. By investigating both disorders in the same population, each provides a contrast for the other. Although CD are more securely couched in the medical profession (no one would deny the validity of treating a child with uncontrolled fits) than HA, what is learned about the needs of CD children and shortcomings in their treatment may shed light on the problems of the HA child, his family, and doctor. Such inquiry may also provide insight into the treatment of many children with chronic childhood disorders that require medical and psychological intervention.

Although the teacher can provide valuable information about drug treatment (Gadow, 1976; Johnson & Prinz, 1976; Gadow, Note 1, Note 2), more detailed information about the drug regimen must be obtained from either parents (Solomons, 1973), medical records (Loney & Ordoña, 1975), or from physicians (Sandoval, Lambert, & Yandell, 1976; Sprague & Sleator, 1975). In order to characterize the use of medication with children in ECSE programs, a three phase study was designed to survey the teachers and parents of children receiving psychotropic and anticonvulsant drugs. In Phase One, a general questionnaire was mailed to all teachers (Gadow, 1976). The objectives were to: (1) determine the prevalence of drug therapy, disorders treated, medications prescribed, and the patterns of usage, (2) characterize teacher experience with children receiving medication and involvement in the drug regimen, (3) assess teacher attitude toward different role behaviors in the drug regimen for hyperactivity and convulsive disorders, (4) describe teacher training about the use of medication for hyperactivity and convulsive disorders and teacher involvement in drug therapy, and (5) identify problems and questions both teachers and parents have about medications. For Phase Two, teachers completed medication questionnaires for each child reported to have received drug therapy during the school year (Gadow, Note 2). The objectives of this phase of the study were to: (1) describe teacher evaluation of the effectiveness of medication and extent of side effects, (2) describe actual teacher involvement in each phase of the drug regimen from data collected on each child, and (3) identify problems teachers encountered with children, parents, and physicians. Phase Three was a telephone interview with the parents of children receiving medication. The objectives of this phase were to: (1) gather information about the medication including dosage, when administered, reason for prescription, duration of therapy, and reasons for terminating medication, (2) describe parent evaluation of therapeutic effectiveness and side effects, (3) determine compliance, adequacy of monitoring procedures, and whether parents altered the dosage or gave extra medication on sepcial occasions, and (4) identify problems parents encountered with the school and the physician.

This survey is by no means a substitute for well-controlled laboratory research on the therapeutic effects and untoward reactions of psychotropic and antiepileptic drugs, but rather an inquiry into how drug treatment is used with a large number of young children under the management of a number of different doctors, teachers, and parents. A preliminary report of the data collected during Phase Three is presented in this paper.

METHODOLOGY

The use of drug therapy for learning, behavior and convulsive disorders with children in ECSE programs was studied in a three phase survey. In Phase One, teachers were asked to report all children, by age and sex, who had received drug therapy at some time during the school year (Gadow, 1976). By completing the Early Childhood Medication Questionnaire, they also reported background information about their programs, experience with children receiving drug therapy, their parents and doctors, attitudes toward their role in the drug regimen, and training about drug treatment with children. In Phase Two, teachers were asked to complete a medication questionnnaire about therapeutic response, side effects, their participation in drug treatment, and problems encountered with each child who reportedly received drug treatment. Teachers also mailed a permission letter to the parents of children who received drug treatment requesting them to participate in a telephone interview (Gadow, Note 2). The parent interviews were the third and final phase of the study.

In order to protect the identity of the child and the confidentiality of his/her records, the teacher addressed and mailed the permission letter to the parent. A cover letter, signed by the teacher, was stapled to the permission letter. The cover letter stated the school was participating in the study and was mailing the permission letter to the parent. The permission letter explained that medication information was being collected about children in preschool programs in Illinois and that this information would be used, in part, to train teachers about the use of medication with children. They were instructed that participation was completely voluntary, and if they decided to be in the study, they could withdraw at any time. The letter also explained that no names would be used in data collection, only code numbers. To participate parents completed the permission letter to include name, address, telephone number, time of day they preferred to be called, and signature and mailed it to the investigator in a self-addressed stamped envelope.

Mailing of the permission letter to the parent was at the discretion of the child's teacher. If for any reason the teacher felt the letter should not be sent, e.g., the subject of medication was "too sensitive," the letter was returned to the investigator. Information about the distribution of the permission letters was recorded in a Permission Letter Log. Teachers were asked if the letter had been mailed, if not, why, and if any other measures were used to contact or inform parents about the study. Letters were mailed near the close of the school year.

Within two weeks of receipt of the completed permission letter, each parent was mailed a cover letter and the Children's Medication Chart (CMC). The cover letter explained that an interviewer would call them within two weeks. They were instructed to see if the medication(s) their child received during the school year was pictured in the CMC. The letter also asked parents to return the CMC at the completion of the interview in order that it could be sent to other parents. A self-addressed stamped envelope was enclosed.

The CMC consists of life-size, color reproductions of 31 different trade name products and one generic in various dosages and forms for a total of 69 different capsules and tablets. The inclusion of drugs in the CMC was based, in part, on

previous surveys (Sprague & Sleator, 1973; Gadow, Note 1) and from descriptions of clinical practice (Livingston, 1972). Only those dosage forms considered appropriate for preschool and elementary school children were selected (Physicians' Desk Reference, 1975). The drugs pictured are arranged alphabetically by trade name and by increasing dosage for those drugs pictured in more than one dosage form. Below each drug picture is the trade name and dosage in milligrams. A grid pattern numbered consecutively from one to 69 separates each drug form permitting easy reference by number. With the exception of phenobarbital, trade name products were selected instead of generic because most prescriptions are written in the former (Silverman & Lee, 1974). Those drugs for which generic products are not available were obviously excluded from this consideration.

Parents who returned a permission letter and had a telephone were interviewed. One parent who did not have a telephone was interviewed at the home of a friend. Using the Parent Medication Questionnaire, a trained interviewer questioned the mothers of children receiving medication about their child and drug treatment. Average length per interview was approximately 20 minutes. At the onset, the interviewer read a prepared statement describing who she was and the purpose of the call. Next, the parent was asked to locate the CMC and identify the medication(s) their child was receiving, or, if drug therapy had been terminated, the last medication(s) the child received when drug therapy was terminated. The exact identity of the drug by dosage and form was recorded after the parent identified the drug by its number in the CMC. For medications not pictured, interviewers obtained a description of the drug including name, color, form, identification marks, and dosage if known. Identification of non-pictured drugs was made by comparing the name and parent description to the drug information provided in the Physicians' Desk Reference (1975). This was a simple matter for trade name products. Phenobarbital, a generic product, presented more problems if the parent did not know the dosage. In such cases, a dosage of 20 mg/5 cc, the only one reported for liquid phenobarbital, was assumed. Using the same procedure, other drugs the child had received during the school year were also recorded.

The Parent Medication Questionnaire consists of five sections. Information about the drug(s) used during the school year, time of day and frequency of administration, reason for which drug was prescribed, duration of treatment, and reason for termination if appropriate are collected in part one. For each drug the child is receiving at the time of interview, or, if drug therapy has been terminated, the last medication(s) the child received, the parent is asked if the name of the drug is on the bottle. Data is also collected on the child's age, sex, and the name of the child's teacher. Parts two, three, and four concern HA, CD, and other disorders (GEN) respectively. Each of these sections contain questions about therapeutic response, side effects, physician referral, drug-free periods, and dosage. (Similar questions concerning the therapeutic response and side effects were asked of the child's teacher in Phase Two (Gadow, Note 2).) Information about physician monitoring, parent dosage adjustments, compliance, and problems with doctor and school is gathered in the last part of the questionnnaire.

At the close of the interview, the interviewer read a prepared statement thanking the mother for participating in the study and requested the return of the CMC.

For purposes of data analysis and discussion, the children about whom data were collected were separated into four groups: HA, CD, HA-CD, and GEN. Children in the GEN category were excluded from data analysis with the exception of discussions of drug data collectively. With few exceptions, drug data from part one of the interview questionnaire were analyzed by disorder. Data about HA-CD children were treated either collectively, i.e., referring to the child and not the disorder, or separately, i.e., data about HA and CD were discussed separately, depending upon the topic. Part three and part four were analyzed by disorder, HA and CD respectively. Parallel analyses were made for HA and CD data about HA-CD children, e.g., data about HA from the HA and HA-CD groups were not combined but were presented side by side. However, comparisons were generally omitted from discussion with the data simply presented in tabular form. For the last part, data about HA and CD children were analyzed separately. HA-CD children were excluded because distinctions between the responses for the two disorders could not be made.

Results

In Phase One there were 157 teachers who reported a total of 357 children who received drug treatment at some time during the school year. Because one response was late, medication questionnaires for 355 of these children were mailed to 156 teachers in Phase Two. Due to survey restrictions, the number of teachers available for participation in Phase Three, i.e., mailing parent permission letters, was reduced to 148. This reduction in teachers also limited the number of children available for data collection to 337 (see Tables 1 and 2). Therefore, of the total number of teachers surveyed in Phase One,

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94.3% were available for participation in Phase Three, and 94.4% of all children reported to have received medication were available for data collection.

From information in the Permission Letter Logs and returned permission letters, it is assumed that 112 (75.7%) teachers participated in Phase Three making contact possible with the parents of 246 children (73.0% of the 337 children about whom data could be collected). However, permission letters were not sent to the parents of 29 (11.8%) of these children because there was no phone in the home, child had moved away or withdrawn from school, or teachers considered the parents high risk (see Tables 3 and 4). As a result, the

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Insert Tables 3 and 4 about here
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parents of 217 children received permission letters or were asked to participate of which 115 (53.0%) returned permission letters. Two parents could not be interviewed because they did not have a telephone. Assuming none of the high risk parents (16) would have responded, a conservative estimate of parent participation is 49.4%. Of the 112 teachers that participated in Phase Three by mailing parent permission letters, 74 (66.1%) had at least one parent who returned a letter to the investigator.

From parent statements about the reason for drug treatment, 52 of the 112 children were characterized as HA, 44 as CD, and 14 as HA-CD. Of the two remaining, one received an unknown drug for sleep problems and the other a muscle relaxant (Valium) for cerebral palsy. Three of the HA children also received drugs (Valium, Atarax, and Noctec) for sleep problems at some time during the school year. Four of the CD children received drugs for reasons other than seizure control: Diamox to releive pressure on the brain, Dilantin to control HA produced by phenobarbital, Seconal rectal suppository to relax body following a seizure, and Atarax for sleep problems. One HA-CD received Valium for "nerves."

Comparison between responses from the teacher medication questionnaires in Phase Two and parent interviews are possible for 92% of the HA children and 93% of the CD children reported in Phase Three (see Table 5). There were seven

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omissions, four of which were the return of General Medication Questionnaires which were mailed to teachers if the reason for medication stated in Phase One was not clearly identifiable as either HA or CD. Two were the result of unreturned medication questionnaires and one because classification as HA or CD was difficult to judge. For the HA-CD children there are eight omissions, two of which are unreturned medication questionnaires. Six of the HA-CD children were identified in Phase One as having only one disorder; four were CD and two HA. At least one teacher medication questionnaire was returned for all but three (2.7%) of the 110 children about whom data was collected from parent interviews.

Demographic data about the children receiving drug therapy are presented in Table 6 by disorder. A significantly greater number of males are HA than CD ($X^2 = 7.86$, df = 1, $p < .01$). Also, drug therapy was terminated for a significantly

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greater number of HA children than CD ($X^2 = 13.07$, df = 1, $p < .001$). This is also true when HA children on drug-free periods are grouped with the children actively receiving medication ($X^2 = 8.59$, df = 1, $p < .01$).

The sample of children in Phase Three are quite similar to all the children that were reported in Phase One to have received drug therapy at some time during the school year (see Table 7). There are 4.5% more males

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in Phase Three than Phase One, and, for the other variables, age, actively receiving medication or not, race, and reason for medication, what differences that exist are even more slight.

Differences between the two phases in terms of characteristics of the children by disorder is also modest. For HA, there are 5.7% more males and 14% more children off medication in Phase Three than in Phase One. However, when adjustments are made for the children on drug-free periods and termination of drug therapy after Phase One data was collected, the difference in the termination of medication is only 2.5%. For CD children, there are 2% more males and 3.4% fewer children off medication in Phase Three than for Phase One. There are only slight differences in age and race for both groups.

The accuracy of parent drug reports is dependent, in part, on whether parents know the name of their child's medication and the degree to which the CMC represents the drugs administered to this group of children. The name of the drug is listed on the bottle for 96.9% of the most recent medications which account for 71.4% of the total drug volume. For only one drug out of all those reported in the study was the parent uncertain about the name. A total of 226 drugs were reported of which 46 (20.4%) are not pictured in the CMC. However, only 17 (7.5%) are not pictured in another form and/or dosage. Of the 29 drugs not pictured but represented in another form in the CMC, 27 are liquids and two are larger dosages (Deaner, 100 mg). Along with omitting certain drugs, 31 of the 69 drug forms pictured in the CMC are not included in parent reports. However, only 11 (eight different drugs) are not reported in any other dosage and/or form.

The most frequently reported drugs by dosage and form are presented in Table 8. These 23 drug forms account for 80% of all reported medications.

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These 23 drug forms account for 80% of all reported medications. Those drug forms marked with an asterisk are not pictured in the CMC, but only Cylert was not pictured in another dosage and/or form. These omissions constitute only 15.6% of the total 180 drug mentions.

The drugs reportedly used in the management of HA in children identified as HA and HA-CD are presented in Tables 9 and 10 respectively. Although

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stimulants are by far the most frequently prescribed drugs, 61.1% of the total drug volume, a wide variety of drugs are reportedly used for the management of HA. Ritalin was administered to 61.5% of the children at some time during the school year. Excluding drugs terminated prior to the most recent drug regimen and drugs administered only in the evening, the prevalence of drug treatment by drug category is as follows: stimulants (71.2%), major tranquilizers (9.6%), minor tranquilizers (7.7%), and other (13.5%). (With these restrictions, only one child is receiving more than one drug at a time for HA.) The most dramatic difference between the HA and HA-CD children in terms of relative frequency of drugs is the use of major tranquilizers which were prescribed for six (11.5%)

of the 52 HA children and six (42.9%) of the 14 HA-CD children at some time during the school year.

Drugs reportedly used for the management of CD in children identified as CD and HA-CD are presented in Tables 11 and 12 respectively. Dilantin, pheno-

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barbital and Mysoline are the most frequently reported medications, 67.7% of all antiepileptic drugs. At some time during the school year, 61.4% of the children received Dilantin, 56.8% phenobarbital, and 29.6% Mysoline. The percent of children that received Dilantin and phenobarbital are similar for both CD and HA-CD children.

Over half of the children receive more than one different drug during the school year, and 23.6% receive three or more (see Table 13). Multiple drugs

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are reported for 61.4% of the CD children and 30.8% of the HA children (X^2 = 9.02, df = 1, $p < .01$). Multiple drug mentions are expected for HA-CD children, however, one mother reported that Tegretol is used to control both seizures and hyperactivity.

Drug combinations are reported for 30.9% of the children with a significantly (X^2 = 19.23, df = 1, $p < .001$) greater number for CD than HA (see Table 14).

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Because these data do not include terminated medications, some children may have received a fewer or greater number of drugs in combination earlier in the school year. Only five (9.6%) of the HA children receive drugs in combination, and, for all but one, the additional drug(s) is administered only in the evening for sleep problems. In striking contrast, 50% of the CD children receive more than one drug at a time, two receiving as many as four and five. Of those CD children receiving only one drug at a time, phenobarbital is the most frequently reported (54.5%), and Dilantin is second (22.7%). Of the 22 children receiving two or more drugs, the most frequent two-drug combinations are Dilantin and a barbiturate (9), Dilantin and Mysoline (6), and Mysoline and phenobarbital (3). All drug mentions for Valium and the succinimides (Zarontin and Celontin) are in combination with other anticonvulsnt drugs. The relatively few drug combinations for the HA-CD group is due, in part, to the fact that only eight were receiving drugs for both disorders at time of interview.

The number of times per day each drug is supposed to be administered for HA and CD is presented in Tables 15 and 16. Stimulants, the most frequently

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prescribed drugs for HA, are typically administered two (43.5%) or three (28.3%) times per day. When Cylert, a drug administered only once a day, is excluded, single daily dosages account for only 16.3% of those drug regimens that could be prescribed more than once a day. Of all the reported drug regimens for HA, 77% involve multiple daily dosages. To an even greater degree (91.6%), drug regimens for CD are in divided dosages with 53.6% being three or more daily administrations.

The time of day each drug is supposed to be administered for HA and CD is presented in Tables 17 and 18. The total percentages for each drug category

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indicate the percent of drug regimens that involve administrations at a specific time of day. For example, 95.7% of the drug regimens for stimulants include a morning dose and 65.2% a noon dosage. Interestingly, for 28.3% of the stimulant drug regimens a dose is given in the evening. The most frequent times of administration for major and minor tranquilizers are morning and evening. The percentage of all 167 drug administrations by time of day is listed in the grand total. The most frequent are morning (40.1%), noon (25.1%), and evening (20.4%). The general pattern for drug administrations across the different drug categories for CD is high (90% or more) morning and evening administrations with moderate (30% - 50%) noon dosages. Of all 241 drug administrations for CD, 36.1% are in the morning and 34.9% in the evening.

Evaluating only those drugs the child is actually receiving at the time of interview, or if drug therapy was terminated, the last drug regimen, 100.0% of the HA children receive medication in the morning, 65.4% at noon, afternoon (23.1%), supper (15.4%), and 42.3% in the evening. Stimulants are administered to 19.2% of the HA children in the evening. The time of day that CD children receive medication are as follows: morning (95.3%), noon (51.2%), afternoon (25.6%), supper (18.6%), and evening (95.3%). Only two of the 44 CD children receive medication only the evening.

The median daily dose of Ritalin and Dexedrine for HA is 15.0 mg and 16.5 mg respectively (see Table 19). The maximum daily dosage of Ritalin is

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45 mg and for Dexedrine, 35 mg; however, these dosages are for the most recent drug regimen. Two parents volunteered that earlier daily dosages for Ritalin

were 65 mg/day. Data were not collected on the dosage range for each drug during the school year, i.e., changes in dosage. The maximum value for Deaner is quite high, 600 mg/day. The median dosage of Mellaril for HA-CD children, 34.0 mg/day, is much larger than for the HA children, 20.0 mg/day (see Table 20).

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The actual number of children that received Mellaril is the same for both samples.

The median and maximum daily dosages for antiepileptic drugs are, for the most part, unremarkable (see Tables 21 and 22).

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Drugs terminated prior to the most recent drug regimen, i.e., regimen when interviewed, or, if no longer receiving medication, the last drug regimen, are reported by 30.9% of the parents (see Table 23). The figures for the three

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disorders are as follows: HA (25.0%), CD (27.3%), and HA-CD (64.3%). One or two drug terminations account for 82.3% of the cases, but a few children had from four to six drug terminations.

A total of 225 different drugs were reportedly administered to HA, CD, and HA-CD children of which 38.2% had been terminated by the close of the school year (see Table 24). The three most frequently sighted reasons for

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discontinuation are side effects (45.3%), drug not effective (22.1%), and therapeutic improvement (9.3%). Comparison between HA and CD children show some differences. Reasons for terminating drugs which are reported for HA children and not CD are aggravated problem, drug-free period, misdiagnosed, child developed tolerance to therapeutic response, and rebound effect. For CD children, side effects and drug not effective are reported more frequently than for HA children.

Drug therapy was terminated for either HA or CD for 26 (23.6%) of the 110 children, all but three for HA (see Table 25). Excluding children on

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drug-free periods, 14 of the HA children were not receiving medication when interviewed near the close of the school year. Interestingly, for only four (28.6%) of the children is discontinuation of drug treatment because the child improved therapeutically. The most frequent reasons for termination are unwanted effects of the drug (side effects, aggravated problem, and drug interaction) and ineffectiveness of drug therapy (drug not effective, developed tolerance to therapeutic response, and misdiagnosed).

Although parents were asked how long their child received each reported drug, they were not asked the total duration of treatment or when the child first received medication. However, it is possible to develop conservative estimates of both duration of drug treatment and age at onset of drug therapy from available data (see Table 26). Estimating duration of drug treatment

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for children who received only one drug during the school year is a simple matter of recording duration of treatment for that drug. In the case of multiple drugs, the drug received the longest is the indicator for duration. If terminated drugs extend the duration of treatment, they are added to the total treatment length if it can be clearly established they predated the use of the longest recent drug. Duration figures are estimates of total treatment length because they exclude any medications the child may have received prior to the onset of the drugs reportedly received during the school year. Also excluded are drug regimens that may have started at an earlier age but were terminated before the present drug regimen was established. Age at onset of drug treatment is calculated by simply subtracting duration of treatment from the child's present age. Because the exact date of termination of drug therapy was not requested, data about age at onset could not be calculated for children off medication at interview.

The median age at onset of drug therapy for HA children is 54 months, twice that of CD children, 26 months. Although the median age for HA children is eight months older than CD children at time of interview, it is clear that drug therapy is initiated at a much earlier median age for the latter. The earliest age at onset of drug treatment for CD is one month and for HA 12 months. There are also dramatic differences in the duration of drug treatment between the two groups. For children receiving medication at time of interview, the median duration of drug treatment for CD is 30 months compared to 12 months for HA. A duration of drug treatment for HA of two years or more is reported for eight (23.5%) of the 34 children on medication with a maximum duration of five and a half years for a six and a half year old boy. The median duration of treatment for HA children off medication at interview is 4.5. (Only two of these 18 children received medication for one month or less.)

Estimates of the number of children placed on drug therapy during the school year can be made by comparing duration of treatment data in Phase Three with similar data reported in the teacher medication questionnaires from Phase Two. Teachers reported estimates of duration of drug treatment while child was enrolled in school, total months of enrollment, and whether they participated in the diagnosis of the disorder. Comparing data from the two sources, it is estimated

that 15 (29.4%) of the 51 HA children about whom parent and teacher data were available received drug therapy after entry into the special education programs. This excludes children who were taken off medication for a while before being placed on another drug. The figure for children actively receiving medication at time of interview is 26.3% and 38.5% for those children for whom drug therapy was terminated. Using the duration of treatment figures for the 38 HA children actively receiving medication and those recently placed on drug-free periods, 15 (39.5) received medication for nine months or less and 12 (33.3%) for eight months or less. Because the decision to prescribe medication may be due, in part, to school referral, enrollment in school may be a more appropriate way of describing new cases than simply duration of treatment. For this sample, five of the 15 children placed on medication during the school year were referred by school personnel.

Only 5 (11.4%) of the CD children received medication for less than 12 months of which the longest duration of treatment is seven months. Four (9.1%) of the children received medication after school enrollment, but none of the mothers interviewed indicated that their child was referred for medical evaluation by school personnel.

Most mothers (84.6%) of HA children feel medication is helpful; the figure is higher (92.1%) for children who are actively receiving medication (see Table 27). Of the seven for whom there is little or no improvement in

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behavior, five were not receiving medication at time of interview. Two mothers of children receiving medication at interview said drug therapy did not help their child, and another was uncertain whether it was the school or drug treatment that produced an improvement in behavior because both were initiated at approximately the same time. Over half the parents report problems with medication; 46.2% mention side effects.

Parent descriptions of how medication helps their child is presented in Table 28. Change in motor activity is the most frequently reported category

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of behavioral improvement accounting for 37.9% of all responses. The second most frequently reported category is manageability, the child's response to parental directives. Grouping better concentration and task completion with improved attention, the attention category accounts for 14.6% of all responses.

Of the children grouped as HA, parents describe 90.4% as being HA (over-active) and 89.4% less HA on medication (see Table 29). There is considerable

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agreement that medication improves attending behavior. Although agreement was more modest, many parents feel medication improves peer relations (61.5%) and facilitates task completion (65.4%). A greater number of parents whose children are actively receiving medication perceive therapeutic improvement on all five variables than parents of children for whom drug therapy had been terminated. This is as expected because a significantly greater number of the children off drug treatment at time of interview are perceived by their parents as not helped by medication than those children actively receiving medication ($X^2 = 4.13$, df = 1, $p < .05$).

The intercorrelation of the five evaluation variables is presented in Table 30. Uncertain and no responses are grouped together. There are moderate

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intercorrelations between HA and attention (r = .68), attention and follows directions (r = .61), and attention and task completion (r = .63). The variable with the lowest intercorrelations is peer relations.

Side effects are reported for 35 (47.3%) of the 74 drugs prescribed for HA. The side effects of the most frequently prescribed drugs are listed in Table 31.

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Half of the parents of HA children indicate that someone had suggested they see a doctor about their child's problems and/or the advisability of medication, but data were not collected on exactly what the parents were told (see Table 32). A variety of people from different settings are named, but

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they are from basically two groups, educational (42.3%) and medical (46.2%) personnel. Only 11 of the 52 mothers report referral by school personnel, either public or private, and only three (5.8%) by a public school teacher. A third of the referrals are from doctors, presumably from one specialty to another. However, this inference must be qualified because only a few of the mothers specifically stated the interaction, e.g., pediatrician referred child to neurologist.

Drug-free periods, temporary breaks in medication to assess the continued need for treatment, are reported for 57.7% of the HA and 42.9% of the HA-CD children (see Table 33). If children actually on a drug-free period

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at time of interview are grouped with the children on medication, 55.3% of the HA children on medication received a drug-free period as did 64.3% of the HA children off medication. Interestingly, for 58.8% of the HA children on medication who received a drug-free period, the break in medication is parent initiated, and, for the seven who indicate another person as an initiator, only two name the child's doctor. The figures are somewhat different for children off medication; for 36.4% the break is parent initiated. The physician is the primary agent for initiating a break in treatment for the other children. Combining both children on and off medication, the initiators of drug-free periods are as follows: parents (50.0%), doctors (35.7%), teachers (7.1%), and others (7.1%). Of the children receiving medication at time of interview who did receive a break in drug therapy, 31.2% are within the last three months, 62.4% within the last six months, and all but two within a year. Adding in children who are receiving breaks in medication at interview, 70% received a drug-free period within the last six months. The median duration of treatment for children who received a break in treatment is 12 months and for those who did not, nine months. The range in duration of treatment for the latter is 3-36 months. All but three (5.8%) of the HA children receive medication every day. For two of these children, medication is not administered during the summer and the other not on weekends or holidays.

Parent descriptions of what happened when child was placed on a drug-free period are presented in Table 34. The two most frequently reported

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complaints are changes in motor activity and difficulty controlling their child. Parents of six of the nine HA children off medication report little or no change in behavior, and one says that behavior improved during break in drug treatment.

A number of parents feel the dosage of medication should be changed (see Table 35). For the children on medication, 13 (34.2%) parents feel the

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amount of medication should be altered; eight want the dosage increased to enhance therapeutic response and five want dosage lowered because of side effects.

Parent perception of the effectiveness of medication for CD and observation of side effects is presented in Table 36. Only two parents of

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CD children reported medication did not help; one child was diagnosed as having subclinical seizures and the mother of the other child said she didn't feel her child still had seizures. Side effects of drug therapy are reported by 38.6% of the parents of CD children.

Almost all of the CD children are characterized as having at least one overt seizure (see Table 37). However, two CD children and four HA-CD children

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never had an observable seizure. Many of the parents (66.7%) know the name of their child's convulsive disorder, and 47.6% stated a specific type of seizure.

Many of the children (38.1%) have uncontrolled seizures and 23.8% on a daily, weekly, or monthly basis (see Table 38). However, of the children

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reported as being seizure-free, 12 (46.2%) had a seizure within a year and eight within the last six months. Over half (24) of the 42 CD children that had overt seizures had at least one seizure within the last six months. Several children (19.5%) have seizures only during a fever, and all but one received medication on a continuous basis.

Parent comparisons of their child's behavior to other children on five possible indices of drug toxicity are presented in Table 39. Of the indices,

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the most frequently reported are poorer coordination and balance (72.7%) and blank stares (50.0%). Drowsiness is reported for 18.2% of the CD children. In an attempt to determine if affirmative responses indicate drug toxicity, parents were also asked if their child exhibited these behaviors before drug treatment (see Table 40). Very few of the children are described as being

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different before medication, but at least a third of the parents are uncertain about premedication behavior for each of the five indices.

There is very little intercorrelation between drowsiness and the other indices of possible toxicity (see Table 41). However, there are moderate

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intercorrelations between confused, blank stares, and off in another world.

Side effects are reported for 36 (37.5%) of the 96 drugs prescribed for CD children. Side effects of the most frequently prescribed drugs are presented in Table 42.

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Eight of the parents (18.2%) feel the dosage level should be changed. The reasons stated for wanting the dosage changed are as follows: side effects (4), drug not controlling seizures (2), child clinically improved (1), and child has more seizures during summer because he gets less sleep (1).

Only four of the parents of CD children said someone suggested their child should have a medical evaluation and/or inquire about the advisability of medication. Physicians are sited by three of the parents, presumably a referral from one medical specialty to another.

Only two of the CD children ever received a break in medication and one a dosage reduction to assess therapeutic need (see Table 43). For all three,

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evaluation of medication was under the direction of a doctor and followed by a reoccurance of seizures. The mother of one HA-CD child, however, temporarily terminated drug treatment on her own initiative.

HA and CD children are not significantly different in terms of parent perceptions of the helpfullness of drug therapy, problems with medication, and incidence of side effects. However, they do differ significantly in referral, parent attitudes about dosage changes, and drug-free periods. A significantly greater number of of HA than CD children are referred for medical evaluation and/or the advisability of medication ($X^2 = 18.57$, df = 1, $p < .001$). The agents of referral also differ dramatically; primarily physicians for CD children and many different people from medical, educational, and other settings for HA children. A significantly greater number of parents of HA children feel the amount of medication should be changed ($X^2 = 7.40$, df = 1, $p < .01$) even when HA children off medication are partialled out ($X^2 = 2.75$, df = 1, $p < .10$). For both groups of parents the primary reasons for dosage change are to enhance therapeutic response and reduce side effects. The occurrence of drug-free periods is also not independent of disorder. A greater number of HA children receive breaks in medication ($X^2 = 27.34$, df = 1, $p < .001$), but for CD children they are more apt to be at the suggestion of the child's doctor.

The recency and frequency of physician interaction is presented in Table 44. Parents report that 51.9% of the HA children and 77.3% of the CD

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children had a doctor visit within the last three months and 86.5% of the HA children and 93.2% of the CD children within the last six months. Of those parents that stated a specific frequency, two or more doctor visits per year are reported for 81.4% of the HA children and 91.9% of the CD children. Appointments with the doctor are typically arranged by the parent for both disorders. When asked if the physician inquires about how their child is

doing in school, parents of 86.3% of the HA children and 78.6% of the CD children responded affirmatively.

Physician approved dosage manipulations are reported for 36.5% and 27.3% of the HA and CD children respectively (see Table 45). Extra medica-

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tion is administered by parents at special times for both HA (26.9%) and CD (22.7%) children. Half of the parents admit forgetting to give medication with three or more forgotten dosages per month reported by 15.4% of the parents of HA children and 15.9% of the parents of CD children.

When asked if they had problems with the doctor or if they wished s/he would do things differently, 16 (30.8%) of the parents of HA children and 10 (22.7%) of the parents of CD children said they did. When asked about teachers, the response was six (11.5%) and four (9.1%) for parents of HA and CD children respectively. Unanswered questions about medication are reported by 25 (48.1%) of the parents of HA children and 14 (31.8%) of the parents of CD children (see Tables 46 and 47). The most frequently reported problems

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with the doctor are the need for more information, poor rapport, and the quality of treatment. Both parents of HA and CD children see the need for more information as a problem with the quality of health care reported more frequently by parents of CD children. Few report problems with the teacher or school. School problems focus on the quality of educational services, and, for parents of HA children, conflicts in treatment objectives. However, the latter pertains to only two children. Questions about medication prescribed for HA children deal primarily with what the therapeutic response is supposed to be and possible harmful effects of drug treatment. The most frequently asked questions about drugs used for CD are side effects and how drug works.

Interestingly, HA and CD children are quite similar in the frequency and recency of physician monitoring, and are not significantly different in terms of physician approved dosage changes, administration of extra medication at special times, or forgotten dosages. Nor do the parents of HA and CD children differ significantly in the frequency of problems with doctors and school personnel and unanswered questions about medication.

Discussion

The return rate for Phase Three (53.0%) is not strikingly different from the response to the first mailing in Phase One (66.0%) and Phase Two (59.2%). If reminder letters had been mailed to the parents, participation in Phase Three may have increased appreciably. Using a procedure similar to the mailing of the initial parent permission letters, the teacher would receive a second Permission Letter Log for nonresponders. By matching the code number on the letter to the description of the child in the Log, the teacher could address and mail the letter to the appropriate parent thereby protecting the identity of the parent and child. However, data collection for Phase One and Phase Two extended to the close of the school year preventing a second and possibly a third contact with the parents.

The sample of children about whom information was collected in Phase Three are quite similar to Phase One children reported to have received drug therapy in terms of age, sex, race, and whether on or off medication near close of the school year. Also, they are only slightly different in the relative frequency of HA and CD and drugs prescribed for each disorder. Therefore, this sample is quite representative of the total number of children reported as receiving drug treatment in terms of demographic characteristics, disorders treated, and type of drugs prescribed.

Only a small percentage of the 246 parents available for contact were considered inappropriate for the study by their child's teacher. There was no significant difference in exclusion between parents of HA and CD children. For only six of the parents was the study considered to be "too sensitive" by their child's teacher, three children were HA, two CD, and one HA-CD. For example, one teacher did not want to send a permission letter because "This child recently had a seizure, and it upset the parent so much that she is quitting work." The typical reason for not sending the letter was emotional problems in the home. One teacher said medication was a "touchy" subject for the parent. Interviewers characterized the mothers as very cooperative, interested in the study, and prepared to answer the questions discussed in the cover letter. In fact, a number of parents volunteered comments such as "I'm glad to see someone doing research on this," or "I'm delighted to help with anything like this. Maybe it will help some other child some day." Although not a part of the study, many parents openly discussed the problems created by their child's behavior to include family and marital conflict.

The identification of the medication their child received during the school year was not a problem for the mothers interviewed. For almost all drugs, the name of the medication was on the bottle, and the drugs pictured in the CMC were representative of the medications prescribed for CD and HA. Most of the frequently prescribed drugs that were not pictured were liquid forms of medications that were represented by tablets or capsules in the CMC. Several parents asked if they could keep the CMC. One mother said, "We go to parent groups and we will . . . talk about these drugs and some people don't always know the names." Another wanted to tape the CMC to her medicine cabinet to help her keep straight the psychotropic drugs she, her husband, and three of her five children were receiving.

Although children were grouped as HA, CD, or HA-CD, no attempt was made to investigate the appropriateness of these diagnostic labels. All but four of the parents of children grouped as HA indicated that drug therapy was for HA. Of those not on medication for HA, two were receiving medication for behavior problems (aggression, tantrums) and two for attentional deficits. The mothers of behavior problem children said their children were not HA, and both were receiving tranquilizers. Ten of the children receiving drug treatment for HA were also described as having other problems, e.g., short attention span, characteristic of the syndrome. Two mothers of children who received drugs for HA said their children were not really HA. One mother explained, "Child seemed HA, but I think it was emotional because I was pregnant and couldn't pick him up. He was the youngest child for four years." The mother of the other child explained that he was placed on Ritalin for HA because of his behavior in the doctor's office while his older brother, being treated for HA, was receiving a check-up. The drug made the younger child "tired," "dopey," and fall asleep in class. Both the teacher and school nurse strongly opposed drug therapy, and the child was taken off medication after a month of treatment. The mother said she knew the child was not HA, having the older son as a comparison, but yielded to the doctor's advice. Children who received anticonvulsants for attentional deficits, MBD, and/or abnormal EEG were difficult to place. One child with attentional deficits was grouped with HA and another with an abnormal EEG with CD.

Although mothers were asked what type of convulsive disorder their child had, many did not know. This plus the considerable inconsistency across classification schemes (Gastaut, 1970) and the inaccessability of physicians' records made grouping by seizure type not only impossible, but beyond the scope of the study. Children grouped as CD either had had at least one overt seizure for which they were receiving continuous drug treatment or had subclinical seizures evidenced by EEG readings. Parents described the former as receiving medication for seizures, convulsions, or epilepsy. Grouping CD and HA-CD children, four were reported as being treated for subclinical seizures. It was not asked, however, exactly what behavioral dysfunction drug therapy was to improve, if any.

A variety of different drugs were prescribed for HA, but the most frequent were stimulants which accounted for 62.2% of the total drug volume. By far the most frequently prescribed drug was Ritalin which was administered to 61.5% of the children at some time during the school year. This is interesting for two reasons. First, the FDA has not approved the drug for use with children under six years of age because safety and efficacy has not been clearly established for this age group (Physicians' Desk Reference, 1975). And second, to my knowledge, only two published, well controlled studies have been conducted with preschool children and Ritalin, and both reported response to drug treatment was different than for older children (Conners, 1975; Schleifer, Weiss, Cohen, Elman, Cvejic, & Kruger, 1975). Conners reported response to treatment was more variable and unpredictable for younger children and Schleifer, et. al., reported a high incidence of side effects, particularly on mood and peer relations. Because Ritalin has been used for the management of HA since 1956 (Safer & Allen, 1976) and the ethical dilemma of denying a young child an effective treatment (Klein, 1974; Shirkey, 1971), it would be inappropriate to make the inference that the use of this agent with preschool children is a case of mismanagement. A number of drugs prescribed for children in ECSE programs carry similar warnings about use with young children (Gadow, 1976), but this uncertainty should be an impetus for adequate monitoring procedures.

It is interesting to note that Cylert, which also carries a caveat about use with children under six years of age (Abbott, 1975), was introduced on the market with a vigorous advertising campaign in the spring of 1975, the same time ECSE data were being collected. Although it had just been made available, it was being picked up in our preschool data collection. (In all but one case the drug was clearly administered after other drugs had failed to produce a desired therapeutic response.) There appears to be a definite need for drug research programs with this age group (Shirkey, 1972; Wilson, 1972).

An argument has been made for the efficacy of a number of different drugs in the treatment of HA (Fish, 1971). Although a great deal of information has been generated about the stimulants (Safer & Allen, 1976; Ross & Ross, 1976; Sprague & Werry, 1974; Wender, 1971), one may seriously question how the other drugs prescribed for this disorder would fare under similar scrutiny, particularly in regard to the enhancement or impairment of cognitive performance and learning.

Comparing the most recent drug regimens for HA (excluding drugs administered only in the evening) to those reported by Krager & Safer (1974) for older children, 71.2% of the ECSE children and 88.2% of the elementary school children received stimulants. The use of Mellaril was higher for the preschool children (9.6%) than for the elementary age (2.6%). Aside from the obvious differences in age, development delay, and handicaps, the Krager & Safer drug survey data were collected in 1973, two years prior to this preschool study which accounts, in part, for the omission of certain types of drugs used, e.g., Cylert and Tofranil, from the elementary school survey. Because it is now generally believed that Dexedrine produces more undesirable side effects than Ritalin (Conners, 1971; Safer & Allen, 1973a), changes in prescribing behavior may account for the relatively greater difference in the use of Dexedrine (29.2% for the 1973 study and 11.5% for 1975) compared to Ritalin.

The relative frequencies of drugs prescribed for HA with children who are HA-CD were dissimilar from those used with HA children. The most striking difference was the use of major tranquilizers, particularly Mellaril: 11.5% of the HA children and 42.9% of the HA-CD children. Teachers identified a greater number of HA-CD children as having a handicapping condition concomitant with HA including mental retardation than HA children (Gadow, Note 2). Therefore, one possible explanation for this disparity in drug treatment is provided by Millichap (1969):

> In the hyperactive mentally retarded child drugs are used primarily to facilitate management. In the child of normal intelligence it is important that the drug should have no untoward effects on learning, and the control of motor hyperactivity should be accompanied by improvement in attention, memory, perception, and coordination. (p. 1241).

Because Mellaril may impair cognitive performance at therapeutic levels (Sprague, Barnes, & Werry, 1970; Werry, 1970), the possibility of further retarding an intellectually handicapped child with drug treatment creates some difficult therapeutic questions.

Although drug regimens for HA typically involve only one drug at a time, children refractory to a single drug regimen may be benefited by combinations of drugs, e.g., Ritalin and Mellaril (Katz, Saraf, Gittelman-Klein & Klein, 1975), only 9.6% of the HA children were reported as receiving more than one medication at a time, and for all but one the additional medication was administered in the evenings, usually a minor tranquilizer (Atarax, Vistaril, Valium). The one reported drug combination was Dilantin and Milontin for a child with attentional deficits.

Most parents of children receiving medication for HA felt the drug had a beneficial effect upon the child's behavior particularly in changing motor activity, improving attending behavior, and making the child more manageable. These same behavioral domains are sampled in drug sensitive rating scales (Conners, 1969, 1970). Of a child receiving Dexedrine, a parent said, "He's less impulsive, can sit still now, his attention span is increased. He's a happier child now, seems more at peace with himself." Comments about activity level were frequent, e.g., "never before [Tofranil] sat and watched T.V.," "still active but channels it better," and "slowed down enough to read to." Parents also reported children were more manageable saying, "It [Ritalin] calms him down to where you can get through to him," or "can reason with him." Also reported were changes in aggressive behavior, "He was mean [before Ritalin treatment] but now I don't have to watch him because he doesn't hurt others," and improvement in sleep cycle, "Without it [Ritalin] he is up at 5:00 a.m. and goes to bed at midnight." One parent said Ritalin helped her child toilet train. Although the actual role of drug treatment is unclear, Schain (1975) reported a similar effect on enuresis. Most parents were commenting on therapeutic improvement with stimulants, but similar reports were made for the variety of other drugs prescribed for HA. When parents were asked to evaluate drug efficacy in terms of specific characteristics, over 90% of the parents of children actively receiving medication felt the drug reduced motor activity and improved attention, and three fourths said medication helped the child to follow directions and complete tasks. Many (68.4%) also felt drug treatment helped improve peer relations.

The median daily dosage of Ritalin, 15.0 mg (range: 5-45 mg), is quite similar to that of Dexedrine, 16.5 mg (range: 5-35 mg). Although it is common clinical lore that twice as much Ritalin is needed for an equivalent therapeutic response to Dexedrine (Safer & Allen, 1976), research on cognitive performance has not borne this out (Sprague & Sleator, 1976). Some parents said daily dosage varied depending upon the child's behavior. For one child, the dose of Ritalin could range from 35 mg to 65 mg per day. These dosage data are similar to those reported for 6-10 year olds from a survey of 700 Chicago physicians in 1971 (Sprague & Sleator, 1973, 1975). The average daily dose of Ritalin for children 0-5 was 11.5 mg and for children 6-10 16.5 mg. For Dexedrine the figures were 6.5 mg/day for 0-5 year olds and 11.0 mg/day for 6-10 year olds.

Although data have been presented demonstrating the efficacy of a single morning dose of stimulant medication (Sleator & von Neumann, 1974; Safer & Allen, 1973b; Sprague, Christensen, & Werry, 1974), stimulants are typically administered two or three times per day usually in the morning and at noon. Because one of the most common side effects of stimulant drug treatment is insomnia (Conners, 1971), which can be produced by a noon dose (Safer & Allen,

1976), it is interesting to note that 15.2% of the stimulant drug regimens involved a dose at supper and 28.3% an evening dose. Kinsbourne (1973) has argued that if stimulants are not given late enough in the day, the therapeutic effect will not overlap hour of sleep, and, combined with a rebound effect, the child may have difficulty sleeping. For the most recent drug regimens, all of the children received medication in the morning, 65.4% at noon, 23.1% in the afternoon, 15.4% at supper, and 42.3% in the evening. In the evening, stimulants were given to 19.2%, minor tranquilizers (Atarax, Vistaril, and Valium) to 13.5% and other drugs with hypnotic properties to 9.6%. It is not known whether some of the preschool children receiving minor tranquilizers and hypnotics at bedtime were doing so to counteract insomnia produced by the stimulants (Arnold, 1973).

The frequency of divided daily dosages of medication imply that many children must receive medication at school especially if they attend a full day of classes and do not return home for lunch. Krager & Safer (1974) report that 61% (1.05% of the total school population) of the HA elementary school children in Baltimore County, Maryland, receive medication at school. Although 65.4% of the ECSE children received a noon administration of medication, only 21.4% received medication at school (Gadow, Note 2). Because preschool classes are typically for a half day (Gadow, 1976), most children can receive medication at home. School nurses administered the medication to the elementary school children in the Krager and Safer study, but teachers administered medication in the Gadow survey. Johnson and Kenney (1975) report that in 1974-75, .65% of the elementary school children in the Minneapolis public schools received medication at school for HA. This figure had dropped to .42% in 1975-76 (Kenney, Note 3).

It was estimated for children actively receiving medication at interview that the median age at onset of drug therapy for HA was 4.5 years (median age at interview was 5.5 years) and median duration of treatment was 12 months, 4.5 months for children off medication at time of interview. These must be interpreted as conservative estimates because children may have received medication prior to the drugs received during the school year or, as several parents indicated, received treatment at an earlier age and stopped for a period before resuming drug therapy. Considering the age of these children, drug treatment may be a lengthy procedure. For example, Solomons (1973) conducted a follow-up study of 97 HA children referred to a university diagnostic center and subsequently treated with stimulant drugs for HA. When surveyed the average duration of treatment was 39 months for children still on medication and 27 months for children off medication. The earliest reported ages at onset of drug treatment for HA children in the ECSE study were 12, 21, and 23 months old. The child who was started on medication at age 12 months was 6 1/2 years old at interview, and, with the exception of a three month vacation on his aunt's farm, had been on Ritalin for 5 1/2 years. Although there is suggestion in the literature for drug treatment with infants, toddlers, and preschoolers (Nichamin, 1972; Renshaw, 1974), as stated previously, few well controlled studies have been published.

A series of studies conducted at the Institute for Child Behavior and Devleopment at the University of Illinois over the last eight years with HA

children and stimulant drugs have repeatedly demonstrated the importance of investigating standardized dosage in relation to different response criteria (Sprague & Sleator, 1973, 1975, 1976). Statistical analyses of different groups of children have repeatedly shown maximum improvement on cognitive tasks with dosage ranging from .3 mg/kg to .5 mg/kg,[3] but when classroom behavior problems as measured by the Conners' Abbreviated Teacher Rating scale is the criteria, improvement in behavior continues to increase through 1.0 mg/kg, the highest dosage evaluated. The importance of this relationship is the significant increase in blood pressure and heart rate in some children at the higher dosage (Ballard, Boileau, Sleator, Massey, & Sprague, 1976) as well as decrements in cognitive performance (Sprague & Sleator, 1976). In order to estimate dosage in mg/kg, each child was assigned the median weight in kilograms for his age (in months) from tables developed by Lowrey (1973) which present weight data for six month intervals by sex. However, such calculations are estimates. For example, the difference between the 10th and 90th percentile for the median age HA male is 6.5 kilograms. Therefore, the mg/kg dosage for a 5.5 year old male receiving 20 mg of Ritalin would be 1.14 mg/kg for the 10th percentile and .83 mg/kg for the 90th percentile, a difference of .31 mg/kg for this particular dose. The estimated median morning dosage of Ritalin is .30 mg/kg (range: .22-.82 mg/kg) and .27 mg/kg (range: .23-.48 mg/kg) for Dexedrine. It is evident from these figures that morning dosages are well within the range of maximum effectiveness for cognitive performance (only 13% were above .5 mg/kg). The total daily dosage of Ritalin is .70 mg/kg (range: .27-2.05 mg/kg) and .72 mg/kg (range: .27-1.69 mg/kg) for Dexedrine. Because only small amounts of Ritalin appear in the blood at therapeutic levels, little is known about the pharmacokinetics (absorption, distribution, and excretion) of Ritalin in humans (Milberg, Rinehart, Sprague, & Sleator, 1975). At this point it is unclear what the relationship is between divided daily dosages in mg/kg and side effects, therapeutic response, and serum level. It should be pointed out that the doses of Ritalin prescribed for these children both in terms of absolute dosage and mg/kg are well below what many experts suggest (Sprague & Sleator, 1975). It would appear, therefore, that with ECSE children as well as other school children (Sprague & Sleator, 1975), physician prescribing practices are conservative.

The estimated median morning dose of Mellaril is .56 mg/kg (range: .48-2.42 mg/kg), and median daily dosage is 1.12 mg/kg (range: .97-2.73 mg/kg). A single daily dose of 1.0 mg/kg of Mellaril has been shown to retard cognitive performance in HA emotionally disturbed children (Sprague, Barnes, & Werry, 1970). Although the morning dose was small for four of the six HA preschool children on Mellaril, one child was receiving 2.42 mg/kg. The dosages of Mellaril for the six HA-CD children are somewhat larger, median morning dose .81 mg/kg (range: .45-2.03 mg/kg) and 1.71 mg/kg (range: 1.34-4.50 mg/kg) for total daily dosage. Half of the morning doses exceeded 1.0 mg/kg.

Side effects were reported for 59.4% of the children receiving Ritalin and 62.5% for Dexedrine. Two common side effects of these drugs are appetite suppression and insomnia (Conners, 1971). Suppressed appetite and/or weight loss was reported for 30-40% of the children who received these drugs. The mother of one six-year-old boy with severe HA said her son lost 17-18 pounds after five months of Ritalin treatment (dosage ranged from 35-55 mg/day).

Safer and Allen (1973a) reported growth suppression with stimulant drug treatment but also observed a growth rebound after drug threatment had been terminated (Safer & Allen, 1975). After reviewing several growth studies, Ross and Ross (1976) conclude that the data, ". . . support a delay rather than a suppression of it [growth]" (p. 112). Long term follow-up studies on HA children who received low and moderate doses of stimulants combined with drug-free periods have failed to show any suppression of growth when compared to normal children (McNutt, Boileau, Cohen, Sprague, and von Neumann, Note 4). Insomnia was reported by 15.6% of the children who received Ritalin and 40% for Dexedrine.

Two of the more alarming side effects for teachers and parents are changes in mood and what Schain (1975) refers to as "personality disturbance" and Schleifer et al., (1975) call changes in "peer relations." A fourth of the parents reported the latter for Ritalin and 40% for Dexedrine. Parents describe their children as "overly quiet," "more quiet than she should have been," "sat in a corner, sucked her thumb, and wouldn't speak at all," "stared in space," and "has a stillness about him chat I don't like." Schleifer et al, (1975) report similar side effects for preschool children which resulted in drug discontinuation for all but three of the 28 children in the study. Side effects were described as "less social behavior and interaction" plus "sadness, irritability, excessive hugging and clinging, and increased solitary play." Schain (1975) reported a similar reaction in 6.4% of the 6-12 year-old-children which he called a personality disturbance. The changes were described as withdrawn, lethargic, and apathetic behavior and other characteristics of depression. From a survey of teachers about teacher-doctor contact and children receiving medication for HA, Weithorn and Ross (1975) reported that 17% of the children were described as lethargic. These reactions may appear concomitantly with an "'amphetamine look', a sunken-cheeked, sallow, dark shadows under the eyes look," described in Ross and Ross (1976, p. 110). A parent described her child as having, ". . . a spacy look about his eyes, has a stillness about him that I don't like." Such an appearance may explain the "zombie" characterizations given to preschool children by their teachers (Sprague & Gadow, 1976).

Safer and Allen (1976) are emphatic about the fact that stimulants ". . . do not sedate the child or leave him 'spaced out'" (p. 56). Such assurance may be premature. One parent said that after four months of treatment the child developed a tolerance to the therapeutic response, and, "It [Ritalin] made him very drowsy, he would just sit in the corner and yawn. When it wore off he was worse than ever, ten times more active than before. But at first it worked." Another mother said the school had called and told her the Ritalin was, "making him dopey in class and sometimes he'd fall asleep." Two other parents reported drowsiness. Drowsiness has been reported in stimulant drug studies with children (Montague & Swarbrick, 1975), and a study of the effects of an acute dose of 10 mg of dextroamphetamine (Dexedrine) produced drowsiness in 13 of the 20 adult subjects within an hour after administration orally (Tecce & Cole, 1974). The drowsiness was followed by a period of heightened alterness two or three hours after ingestion.

As to whether stimulant drugs can "space out" a child, studies at the University of Illinois with stimulants and HA children show that higher doses (1.0 mg/kg) of Ritalin can actually produce decrements on cognitive tasks. For some children performance is well below placebo and no-drug conditions.

I have personally observed children on laboratory equipment after receiving higher doses of stimulants who were confused enough to warrant the label "spaced out." This dose relationship was reported by a parent in the ECSE survey who said at the high dosage (65 mg of Ritalin per day), "It seemed to sedate him a bit. He has a language problem and talks on a three-year-old level. So we are changing the dosage. . . . and with less Ritalin he's a little more HA but talks much better. It's a matter of getting a happy medium." Due to the short duration of therapeutic response, 4-6 hours, some dose-reponse relationships as a function of time after ingestion may have been overlooked. As already discussed, studies of serum level and response relationships are nonexistant.

The seriousness of these "depressive" reactions seems to vary with the researcher. Both Schain (1975) and Schleifer, et al. (1975) see this as an indication to stop treatment while others feel it is simply a matter of decreasing dosage for a few days until a tolerance to this side effect develops (Safer & Allen, 1976). Dr. Esther Sleator, research pediatrician at the Institute for Child Behavior and Development, states that she has observed these reactions only on the higher (1.0 mg/kg) dose of Ritalin and reducing the dosage not only eliminates these side effects but produces a more desirable therapeutic response from the standpoint of cognitive performance (Sleator, Note 5).

Two other side effects which are considered rare were reported. One child possibly had a dyskinetic episode (Mattson & Calverley, 1968) from Ritalin which "calmed her down but made her nervous in other ways--bit her nails and moving tongue around." Another parent reported an exacerbation of stereotyped behavior; the child "rocks much more with the medicine [Ritalin] than without it."

Although considerable attention has been focused on whether or not schools refer too many children suspected as being HA or coerce parents into obtaining medication for their child through their family doctor (Grinspoon & Singer, 1973; Ladd, 1970; Safer & Allen, 1976; Schrag & Divoky, 1975), very little data has been gathered on the actual referral procedures, if any. Half of the parents said someone had suggested they see a doctor about their child's behavior and/or were informed about the advisability of medication. A variety of different people were mentioned as referral sources. Eleven (21.2%) of the parents said school personnel were the referral source of which only three (5.8%) were public school teachers. However, a third of the children placed on medication during the school year were referred by school personnel. Due to the age of the children and the fact that ECSE was their first public school placement, the role of the school in the referral process may be quite different for older children. Some parents (17.3%) said the doctor was the referral source, but, due to the structure of the interview questionnaire, data were not collected on the specialists involved, e.g., referral by a pediatrician to a neurologist.

Four (22.2%) of the children off medication at interview and eight (23.5%) of the children on medication had changes in the type of medication they received during the school year. Terminated drugs were not different in relative frequency from medication in the total drug volume, e.g., stimulants accounted for 64.3% of all terminated drugs. For four of the 12 children, changes in

medication involved more than one drug. A number of reasons were given for changing medication, the most frequent were side effects to include rebound effects, failure to produce therapeutic response, and doctor preference for another agent. For an example of the latter, a mother said the pediatrician put her child on Ritalin, but the child's neurologist switched to Mellaril explaining to the parent the former stunted growth. Although data were not collected on dosage changes during the school year, a third of the parents of children actively receiving medication were unsatisfied with the present dosage, either wanting the amount increased to enhance therapeutic response or lowered to reduce side effects.

Solomons (1973) suggested a minimal criteria for adequate follow-up of drug treatment after dosage had been adjusted as two physician contacts (office visit, telephone, letter, etc.) within the last six months or three contacts per year. Using this criteria, 55% of the children in his follow-up study were considered to be adequately monitored. This is certainly a conservative criteria if one considers the physician could be involved in parent counseling (Schaefer, Palkes, & Stewart, 1974), training parents in behavior management skills (Drabman & Jarvie, 1977), monitoring side effects, compliance, and tolerance to therapeutic response, directing drug-free periods and assessing therapeutic progress. Arnold (1973) states that if the drug regimen is stable and treatment is satisfactory that two or three office visits per year is a good guideline for follow-up. Of the 52 parents of HA children in ECSE programs that were interviewed, 51.9% said their child had an office visit within the last three months, 86.5% within the last six months. Of those parents that stated a specific frequency, 58.1% said three or more office visits per year, and most reported telephone contacts as well. Although physician contacts are a prerequisite for adequate monitoring, they only present an opportunity for inquiry. An analysis of the content of follow-up contacts for HA children treated at a university psychiatric clinic conducted by Loney and Ordoña (1975) revealed, among other things, that target symptoms were neither identified nor evaluated in terms of improvement, teacher and parent rating scales used extensively in diagnosis were seldom a part of follow-up, teachers were rarely contacted directly, and monitoring was achieved by simply asking the parent how the child was doing and attributing any behavioral change to medication. The lack of direct contact between teacher and physician is corraborated with reports from ECSE teachers (Gadow, 1976, Note 2). Only seven (13.7%) of the parents said the physician did not ask them how their child was doing in school. Four of the children were receiving tranquilizers, and, for two others, the physician refused to interact with the school about the child's response to treatment according to the mother. The parent of the other child said the teacher had suggested a drug-free period. Of those who did report physician inquiries about school performance, four commented that the child's teacher sent periodic reports to the doctor.

Although periodic breaks in medication or drug-free periods are considered an essential component of adequate follow-up procedures (Arnold, 1973; Katz et al., 1975; Sleator & von Neuman, 1974) only 57.7% of the parents report opportunities to reevaluate efficacy and necessity of drug treatment. (The median duration of treatment for those children who received a drug-free period and those who did not was 12 and nine months respectively.) For children already receiving medication at enrollment, such breaks in drug treatment provide the teacher with an opportunity to assess the child's educational needs and set treatment objectives (Sprague & Gadow, 1976). Of the children receiving a break in medication, 70.0% were within the last six months. Comparing teacher

data on how long the child was in school and date school closed for the summer to parent reports of how long ago the drug-free period was initiated, it was estimated that 19 (36.5%) of the HA children received a break in medication during the school year. This is higher than teacher reports of drug-free periods (29.8%), but several of the HA children received breaks in medication after medication questionnaires in Phase Two were completed (Gadow, Note 2). It is interesting to note that the primary initiator of such breaks in medication is the parent (50.0%) with doctor suggestions accounting for little over a third (37.7%), teachers (7.1%), and others (7.1%). Weekends, holidays, and summer vacations may also serve as drug-free periods (Arnold, 1973; Safer & Allen, 1976; Sleator and von Neumann, 1974). Breaks over the summer minimize the possibility of growth suppression, and starting the child at school off medication creates an opportunity for reassessing the need for treatment. For severe cases, the dosage may be reduced instead of terminating treatment altogether (Safer & Allen, 1976). Katz et al. (1975) have cautioned that such breaks in the regimen may be a great disservice for some children by denying necessary treatment, e.g., while at summer camp. Only three of the HA children in the ECSE programs did not receive medication every day on a year-round basis. Two children were off for the summer, and the other during weekends and holidays. Another child received a reduced dose during the summer.

As might be expected the child's response to a drug-free period was strikingly different for children actively receiving medication compared to children taken off drug treatment. All but one of the children on medication responded with a return of the disorder. Their behavior during the break in medication was characterized as "uncontrollable," "wild," "destructive," and "wore out family." The reoccurrence of the disorder may be traumatizing for the family of a severely HA child. One mother said that although her doctor recommended a break in medication, she refused. Another said, "It was like letting a lion out of a cage. . . . He was very destructive, tore things up, ran absolutely wild many hours a day." The break in medication was scheduled during her husband's vacation because, "I needed him around; I could never have managed him [son] by myself." Such breaks also provide an opportunity to assess untoward reactions. For example, the mother of a child receiving 50 mg of Mellaril in the morning said, "He was more alert [off medication] but talked constantly and rapidly, couldn't be still." Another mother disquieted about changes in her child's personality commented, "It [break in medication] increased his HA, but we liked him better when he was off it [Ritalin]. He was 'with us' and seemed to be more himself." The weighing of side effects and therapeutic benefits poses problems for parents, teachers, and doctors creating difficult decisions and possible conflict about treatment objectives. Five of the nine children for whom drug therapy had been terminated at interview and had received a drug-free period were characterized by their mothers as unchanged off medication. The rest were described as less HA than before treatment.

Noncompliance with physician instructions including altering dosage or frequency of medication and forgetting to give medication is a problem in effective medical management (Blackwell, 1973; Mattar, Markello, & Yaffe, 1975), and erratic administration can also be a problem for the teacher (Sprague & Gadow, 1976). Over half of the parents of HA children report forgetting to give medication with 15% omitting four or more dosages per month. Because

parents may not wish to acknowledge forgetting medication (Gordis, Markowitz, & Lilienfeld, 1969), these figures should be considered conservative estimates. ECSE teachers felt 12.3% of the HA children did not receive medication regularly (Gadow, Note 2). For the HA child receiving stimulant medication, a forgotten dosage could mean the reappearance of the characteristics of the disorder within several hours after the last administration. Ironically, for some parents a forgotten dose served as an unscheduled drug-free period confirming the necessity for continuous treatment. Or, as one mother commented when asked how often she forgot, ". . . once a month. That's how we discovered we could do without it [Mellaril]."

Over a third (36.5%) of the parents of HA children reported their physician permitted them to alter the dosage if they thought it was necessary and 26.9% reported giving extra medication at special times. Some special situations stated were "when there's going to be lots of people," "at night . . . if he's extra active," "if we go somewhere in the evening," and "if there's going to be some excitement or if he's really wound up." Similarly, Solomons (1973) reported that 28.9% of the parents in his follow-up study reported being permitted to alter dosage or frequency of medication. Although this may be efficacious in some circumstances (Katz et al., 1975; Safer & Allen, 1976) it also characterizes some children who are poorly monitored (Solomons, 1973).

By the close of the school year, 14 (26.9%) of the HA children were no longer receiving medication and four (7.7%) were on drug-free periods. To date, very little data have been collected about the termination of drug treatment (Sprague & Gadow, 1976). The reasons given by the mothers for stopping medication are as follows: side effects (6), therapeutic improvement (4), developed tolerance to therapeutic benefit (4), and two were misdiagnosed, i.e., not really HA. Interestingly, for less than a third was the reason therapeutic improvement, and of these, two still had problems but the mother felt she could cope better. Although the data do not permit a thorough analysis of the interactions between teachers, parent, and physician, in two cases the parents clearly terminated treatment on their own. From both parent and teacher reports, the teacher was instrumental in initiating the termination of medication for at least three children. Most (71.4%) of the children were receiving stimulants when drug therapy was terminated. At least a fourth had tried other drugs but this figure could be much higher if entire medical histories had been obtained. All but three children clearly received an adequate trial of at least one drug. The reasons for termination of the briefer trials (three weeks or less) were side effects and school opposition to medication.

A third of the parents reported things they wish their doctor would do differently, the most frequent being provide more information about medication and their child's disorder, improve medical treatment, and develop a better rapport. Interpretation of these data is limited without an actual analysis of parent-physician interaction. For example, parents may be poorly informed from the standpoint of questions that concern them (Raimbault, Cachin, Limal, Eliacheff, & Rappaport, 1975), or the physician may have informed the parent adequately, at least within the limits of existing scientific data, but the mother forgot, was inattentive because she was under considerable

stress, or was preoccupied with the child's disorder (Baird, 1972). Regardless, rapport and the degree to which parents are informed has direct bearing on compliance to physician instructions (Blackwell, 1973; Elling, Wittemore, & Green, 1960; Haggerty & Roghmann, 1972; Korsch, Gozzi, & Francis, 1968). Almost half of the parents had questions about their child's medication, the most frequent being what the therapeutic response was supposed to be, long term effects, side effects, and how the drug works. Due to questionnaire design, parents were not asked if they sought answers to these questions from their child's doctor.

Only a few (11.5%) of the mothers reported problems with the school primarily about the quality of services and conflicts about what the treatment modality should be. The parent of one child no longer on medication said the school "pushed for medication," and that the teacher had tried behavior modification but did not try hard enough. Both parent and teacher reported therapeutic improvement with Ritalin, but the parent was alarmed by child's "spacing out" in the morning and rebound in the afternoon. (Parent said child had been on Ritalin two years previous.) The teacher felt the dosage was frequently manipulated by the parent making therapeutic assessment difficult. She also stated that she was involved in the referral of the child to the physician but did not have direct contact with the doctor about diagnosis, dosage adjustment or termination of treatment. Conversely, another parent said, "I wish the school nurse hadn't been so negative about Ritalin. She [nurse] would have saved my child a lot of wasted time in school. She [child] wasn't learning anything while not on it [Ritalin]." The child's teacher reported she suggested to the parent that the child be examined by a doctor. Although interviewers encouraged parents to report conflicts and problems with the school, few did. Interviewers described parents as open and cooperative and only a couple mentioned problems with the school about medication. These data, combined with the fact teachers were instrumental in terminating drug treatment and initiating drug-free periods, do not support the lurid exposes of school systems said to be drugging children or pushing medication.

Generating reliable information about the role of the school in the referral process and possible pressuring of parents into seeking drug treatment is quite difficult. Although there is no shortage of anecdotes about inappropriate school referral procedures (Bruck, 1976), the degree to which this happens is relatively unknown. There may have been parents of ECSE children who were pressed by the school to inquire about the advisability of medical intervention but refused and therefore would not have received a permission letter. Also, one may wonder if some parents did not respond because such a conflict did take place. In order to investigate the possibility that some parents resisted school coercion, all parents from a sample of programs would have to be questioned. Due to procedures protecting the confidentiality of school records, schools would have to mail permission letters, and there would still be the problem of nonresponders. Also, parents may not wish to acknowledge that they defied school recommendations. After possible cases of school coercion were identified, the problem of actually analyzing what the school-parent interaction really was would still remain. Random sampling of households is another approach that could be used, but, considering the small percentage of children receiving services in ECSE programs, this would be impractical.

A number of the parents at one time or another during the interview expressed guilt about giving drugs to their child. Some typical comments were, "I don't want him on medication, but right now it means my sanity or his," or "The doctor says I can increase the dose to 40 mg a day but I don't want to hurt him." The mother of one child receiving a large dose of Ritalin said, "Every time I give him one [pill], I think about it [long-term effects]. It's sort of like taking a butterfly that's wild and free and caging it. If we could live on a farm where he could run wild it would be different, but I guess in our society he has to learn to conform and accept learning that kind of thing."

The three most frequently prescribed drugs for CD were Dilantin, phenobarbital, and Mysoline, and Dilantin and phenobarbital for CD with children who are HA-CD. Because the different types of convulsive disorders respond best to different drugs (Livingston, 1972), the relative frequency of specific drugs also reflect, to a certain degree, the prevalence of different convulsive disorders (Epilepsy Foundation of America, 1975). Grand mal seizures may have an onset at any age and are the most common type of seizure reported for over 80% of the people with epilepsy. The drugs of first choice by safety and efficacy are phenobarbital, Mysoline, and Dilantin. Mebaral may be used as an alternative to phenobarbital if the latter produces marked drowsiness or HA. True petit mal (absence) seizures are not common with a prevalence of only 2-3% of all epileptics and 6-12% of children with seizures. The age at onset of petit mal seizures is typically between four and eight years. The drugs of first choice are Zarontin and Tridione, but if response is unsatisfactory, other succinimides (Celontin and Milontin) or Paradione may be used. Psychomotor seizures are quite uncommon among young children. The drugs of first choice are similar to grand mal agents with the addition of Tegretol as possibly the most effective. Livingston divides myoclonic epilepsy (petit mal variant, salaam spells, akinetic seizures, Lennox-Gastaut syndrome) into two groups: myoclonic epilepsy of infancy and myoclonic epilepsy of older children. The typical age at onset of seizures for the former is between three and nine months and between three and seven years for the latter. The disorder is typically concomitant with mental retardation, usually severe, and frequently refractory to drug treatment. The prognosis is exceedingly poor. For infants, intramuscular injection of ACTH (corticotropin) and oral corticosteriods (cortisone or prednisone) may be instrumental in seizure control. Benzodiazepines, e.g., Valium, may also be useful in seizure control as well as a newly approved agent, Clonopin (clonazepam) (Medical Letter, 1976). Livingston prefers the ketogenic diet for the treatment of myoclonic epilepsy, especially for children between two and five years of age. Because it was impractical to gather diagnostic data on the children in the survey, it could not be determined what drugs were actually prescribed for the different convulsive disorders.

Only two of the drugs reportedly used for the management of CD could be considered "unusual." One, a benzodiazepine, Tranxene (chlorazepate dipotassium), was prescribed for two ECSE children with CD but is not yet approved by the FDA for that purpose (Physicians' Desk Reference, 1975). The other drug was Tofranil reportedly used in seizure control for a child who had previously received six other unsuccessful drugs. Although Tofranil (imipramine) may exacerbate grand mal and psychomotor seizures, at low dosages it is also an anticonvulsant (Lange, Julien, & Fowler, 1976). For the child in question, the drug regimen reported at interview was Tofranil and Mebaral.

Half of the CD children received two or more drugs in combination, and two children received as many as four and five. Polypharmacy may be necessary for several reasons (Livingston, 1972). First, an initial drug may be helpful in reducing the frequency and severity of fits but not completely adequate. Another agent may be added to see if therapeutic response can be improved, and two or three drugs may be necessary if the seizures are particularly frequent or severe. The control of petit mal seizures usually involves a petit mal drug as well as a grand mal agent. The latter is prescribed as a prophylactic measure against the development of grand mal seizures which usually appear between 10 and 13 years of age in these children. Because many epileptics may have more than one kind of seizure (Gibbs & Gibbs, 1952; Lennox, 1960), it may be necessary to use different agents to control the different types of seizures. Although more than one drug may be necessary to achieve adequate control of fits, the efficacy of prescribing more than three has been called into question (Livingston, 1972; Wilson, 1969). The most frequently reported drug combinations were Dilantin and a barbiturate, Dilantin and Mysoline, and Mysoline and phenobarbital. For children receiving only one medication, phenobarbital was the most frequently reported drug (54.5%) and Dilantin second (22.7%).

Almost all antiepileptic drug regimens were in divided dosages with 63.7% administered three or more times per day. It has been demonstrated that divided dosages are necessary for maintenance of constant serum levels (Svensmark & Buchthal, 1964). Combining multiple drug regimens when appropriate, CD children received medication at the following times: morning (95.3%), noon (51.2%), afternoon (25.6%), supper (18.6%), and evening (95.3%). Only 8.9% of the CD children in ECSE received medication at school (Gadow, Note 2).

The median daily dosages of Dilantin, phenobarbital, and Mysoline were 100 mg., 60 mg, and 300 mg respectively, and are characteristic of clinical practice (Livingston, 1972). It should be pointed out that there is considerable variation across individuals in terms of dosage of medication and seizure control.

Side effects were reported by 38.6% of the parents and for 37.5% of the total number of drugs. The relative frequency of side effects for the five most frequently reported drugs were as follows: Dilantin (48.1%), phenobarbital (28.0%), Mysoline (38.5%), Valium (50.0%) and Mebaral (33.3%). (The low incidence of somatic side effects and the fact it is inexpensive make phenobarbital one of the most preferred antiepileptic drugs (Livingston, 1972).) Side effect reports must be qualified to some degree. First, the majority of anticonvulsants for which untoward reactions were reported were used in combination with other drugs. Therefore, there may have been some confusion identifying the causal agent. Second, side effect reports were unprompted, i.e., parents were not asked if specific changes took place. It is possible, therefore, that some side effects were either unreported or unrecognized as a product of drug treatment.

The most frequently reported side effects of Dilantin were gingival hyperplasia (excessive growth of gum tissue), ataxia (unsteady and uncoordinated walk with a wide base), and Dilantin intoxication. The latter is characterized by nystagmus (involuntary rapid movement of the eyeball), ataxia,

lethargy, dysarthria (inarticulate, thick, or slurred speech), and at high dosages, acute confusional states (Kutt, 1964). Gingival hyperplasia was reported for 14.8% of the children that received Dilantin; for children Livingston (1972) put the frequency of occurrence at 40%. Ataxia was also reported for 14.8% and was described by one parent as, "If he has too much [Dilantin], he'll act like he's drunk." One child developed hirsutism (excessive growth of body hair) and another dysarthria. Three children were made drowsy. Of the side effects discussed, most are dose related with the exception of hirsutism, which is frequently irreversible, and gingival hyperplasia (Livingston, 1972). However, there is some evidence that the latter may be dose related (Little, Girgis, & Masotti, 1975).

HA and/or changes in temperament that parents described as mean and agressive were reported for 20% of the children treated with phenobarbital. The increased restlessness produced by the drug may not be "true HA" for most children so affected (Stores, 1975). Livington (1972) states the frequency of occurrence of this reaction ranges from 15-20% and is not affected by altering the dosage. The behavioral changes produced by phenobarbital may be an even greater handicap than the seizures (Schain, 1972). Because the drug may exacerbate the disorder, it is contraindicated for HA-CD children (Millichap, 1969). It is believed that Mebaral, which is partially transformed into phenobarbital during the metabolic process, is less likely to produce these behavioral changes (Livingston, 1972). One of the six HA and one of the two HA-CD children who received Mebaral did develop behavior problems. One mother said the side effects were "HA, aggressiveness, and an inability to attend." Drowsiness, reported by two parents, is a frequent side effect of phenobarbital for which the child usually develops a tolerance within two to three weeks after the onset of treatment.

Ataxia was the most reported side effect of Mysoline. Drowsiness, said to be the most common side effect of this drug, was reported only once. As with phenobarbital, tolerance usually develops within two to three weeks.

There may be only a slight difference between toxic and therapeutic serum levels as the following observation illustrates. "It [Dilantin] seems to build up once in a while and he goes into an overdose--his balance goes; he's out of it. He is delirious for 3-4 days and runs a high temperature. . . . We have to walk a fine line with Dilantin dosages." The parent may not always be adequately informed about these side effects. For example, when asked if she had any unanswered questions about her child's medication (Dilantin), one mother asked, "I'd like to know. . . why he staggers around so in the mornings." The dose of antiepileptic drug(s) necessary to achieve satisfactory control of fits may also impair cognitive performance. Depending upon the severity and frequency of seizures, it may be better for the child to experience infrequent seizures at a lower dose than be mentally handicapped by a larger one (Crowther, 1967; Dekaban & Lehman, 1975; Livingston, 1972; Reynolds, 1975; Stores, 1975). Such decisions may be quite difficult to make. For example, one child having 5-7 grand mal seizures per day was receiving at least four drugs in an attempt to control the frequency of fits. While hospitalized for pneumonia, the number of different drugs was reduced to include Mysoline and Mebaral. In what must be considered an understatement the mother said, ". . . off Mysoline her balance returned to the point where she could once again walk. The teacher also noticed it." About another child on multiple drugs for minor motor seizures and whose

drug regimen was being reduced his mother said, "Each time he comes off another pill learning increases and the school has less problems."

The estimated median age at onset of drug treatment for CD children was early, 2.2 years, and median duration of treatment was 2.5 years. All children were receiving medication at interview except two. One was diagnosed as having subclinical seizures, i.e., there were no overt fits, but therapy was discontinued when side effects developed. The other child, treated for febrile seizures, had clinically improved.

Almost all parents felt medication helped their child by reducing the frequency or severity of seizures. Exceptions included one parent who said her child had outgrown the problem and four others who were uncertain because of early onset, dosage adjustment, seizures only during fever, and a diabetic child whose convulsion may have been the result of hypoglycemia. Seizure control was not complete, and many (38.1%) parents said their child still had seizures, most on a daily, weekly, or monthly basis depending in part upon seizure type. Over half (57.1%) of the CD children had a seizure within the last six months, and only seven (16.7%) of the children had been seizure-free for two or more years. From medication questionnaires mailed to ECSE teachers, 26.7% of the CD children had at least one seizure at school during the school year (Gadow, Note 2).

Only four of the parents reported referral to a physician about their child's seizures by another person; and, in all but one case, the referral was by one physician to another. Due to questionnaire design the medical specialties of the physicians involved were not ascertained. Livingston (1972) points out that the teacher may be instrumental in referring children with seizures, particularly types without convulsive movements, e.g., petit mal or psychomotor. The early age at onset of drug treatment and the low prevalence of these types of seizures may account in part for the absence of school referral among children in ECSE programs.

Three-fourths of the parents of CD children said their child had an office visit within the last three months, and over 90% reported at least two office visits per year. Because follow-up involves a number of concerns including toxicity, compliance, therapeutic response, and social-emotional development, minimal criteria for physician contacts and adequate monitoring are difficult to determine. Because serum level analysis is important in the management of children receiving antiepileptic drugs, Kutt (1974) suggests 1 or 2 analyses per year for the well controlled seizure-free patient. He also recommends serum analysis for patients with signs of toxicity, very young patients for whom it is difficult to assess the early signs of toxicity, and patients whose seizures were previously controlled. Kutt also points out that nystagmus, the earliest sign of Dilantin toxicity, is a less reliable sign in children than adults because of diagnostic problems. Livingston (1972) says the minimal criteria for physician contact during follow-up is at least one office visit every six months to include patients who are seizure-free. Gordon (1976) feels follow-up should also include considerations for the possible termination of medication in patients who have been seizure-free for a period of one to two years.

Twelve (27.3%) of the parents reported changes in medication during the school year, for all but two the change involved antiepileptic drugs. Half of the changes were reductions in the number of drugs prescribed as a result of clinical therapeutic improvement. Only five (13.6%) of the CD children had actual substitutions of one drug for another. As might be expected, the most frequent reason for doing so were side effects and therapeutic failure.

Two of the children reportedly received a break in medication and one a reduction in dosage to assess therapeutic necessity, and in all cases, termination resulted in the reoccurrence of seizures. (One of the children that received a drug-free period did so at age 11 months.) One parent of a HA-CD child terminated medication on her own initiative, but for the other children, the doctor directed the procedure. However, this is an incomplete description of termination efforts and considerations because eight parents made comments about either decreasing dosage, reducing the number of medications, or having EEG examinations for their child to assess the desirability of terminating drug treatment. As with parents of HA children, many of these parents also felt guilty about having to administer medication and wished their child did not have to take it.

The termination of drug treatment for epilepsy is usually a drawn out procedure (Livingston, 1972). If the antiepileptic drugs are well tolerated, the physician may wait until the child has been seizure-free four years before starting to discontinue medication. Dosage level is then gradually reduced over a one to two year period. Abruptly terminating medication could precipitate seizures or grand mal status. Termination may be considered after a shorter seizure-free period if medication is producing toxic reactions at therapeutic doses or if the administration of medication is contributing to emotional problems. A number of variables influence the decision to terminate treatment including seizure type, severity, dosage, and whether the seizure-free period overlaps the onset of puberty.

Twelve of the parents said their doctor permitted them to change dosage. Data was not systematically collected about how this was done, but seven parents did volunteer some information. The explanations for changing dosage were clinical improvement (reduction), to prevent overdose (reduction), and prevent possible seizures during fever (increase). (Half of these parents also reported giving medication at special times.) Of the 10 that said they gave extra medication, six did so during fever, two when child was having a "spell" of seizures, and two parents did not specify the circumstances.

Over half of the parents of CD children report forgetting to give medication, but only 15.9% forgot at least three to four times per month. This should be considered a conservative estimate of noncompliance because patients identified as not receiving medication through serum analysis frequently deny (or their parents deny) noncomplaint behavior (Kutt, 1974). Not giving medication or forgetting to may precipitate seizures as exemplified by this statement, "I ran out on Friday and couldn't get any more until Monday. When he's off it that long he has one [seizure]." Forgetting even a dose can be traumatizing for both parent and child. One mother said, "I never forget at night. Once I did and he almost died from swallowing his tongue . . . . I never forgot since that."

Eight (19.5%) of the children experienced seizures only during fevers, and all but one of these children received medication on a continuous basis. Livingston (1972) separates seizures associated with fevers into two groups: simple febrile convulsions and epileptic seizures precipitated by fever. The treatment strategy and prognosis for the two disorders are quite different. By the age of four or five most children outgrow the former having an excellent prognosis. For the latter, however, treatment and prognosis are similar to epilepsy in general. Although drug therapy appears to be of little value in the management of simple febrile convulsions, continuous drug treatment is very important for children with epileptic seizures precipitated by fever because the vast majority develop afebrile seizures (epilepsy) by the age of five. Because parent reports of the first febrile episode are so unreliable and medical records inaccessible, no attempt was made to obtain a differential diagnosis for the children in this survey.

When asked about specific traits, many parents characterized their CD children as having poorer coordination or balance, more apt to have blank stares, be confused or off in another world than other children, but few reported drowsiness. Only a few of the parents said their child was not like that before medication. However, due to the early age at onset of drug treatment and the rapidity of development during the preschool years, many parents were uncertain, for the most part, what their child's behavior was like before the onset of drug treatment. It would be presumptuous to infer that these problems are the result of medication because many of the children have a number of other handicapping conditions. For example, ECSE teachers report that 75% of the CD children have clearly identifiable handicaps with mental retardation, brain damage, cerebral palsy and hyperactivity the most common (Gadow, Note 2). Because these children are not only young but developmentally delayed, it is important to distinguish toxicity from the child's developmental problems and handicaps. Verbal reports of double vision, confusion, drowsiness, or impaired performance are much less probable (and for many, not even possible) than in older children or adults. Also, mental performance can be greatly reduced by heavy medication before the child develops clear signs of toxicity (Dekaban & Lehman, 1975; Reynolds, 1975; Stores, 1975). It would be incorrect to conclude that antiepileptic drugs are an undersirable form of treatment. Quite the contrary, drugs such as Dilantin and Tridione are truly miracles of modern drug research. But, due to the age of the children and their developmental retardation, the importance of adequate monitoring is increased. Difficult decisions may have to be made concerning seizure frequency and deterioration in mental performance, decisions in which the school may be able to play a valuable role (Sprague & Gadow, 1976).

Few parents had problems with their child's doctor or the school. The most frequent complaints about their doctor concern information and rapport, and with the school, the quality of educational programs. As with parents of HA children, they wanted more information from the doctor about medication and their child's disorder. One exasperated mother was going to track down a Parke-Davis detail man to find out more about Dilantin. Perhaps the most disquieting revelation was the nature of teacher training about drug treatment and epilepsy. From an earlier phase of the study, it was reported that only 55.6% of the ECSE teachers received formal training on managing grand mal seizures in the classroom and even less (39.6%) on managing the child's peers (Gadow, 1976). About this situation one mother said, "They [the school] were

afraid of what the seizures were going to be like." Most of the teachers' information was obtained from fellow staff members or personal experience as illustrated by the following remark, "I think they [the school] need an educaation on how to deal with medicine. . . . The parents try to explain it to the teacher. Teacher got a real education when she [daughter] had a convulsion in school."

By collecting data about drug treatment for both HA and CD children, a number of contrasts can be made. For this sample of children from ECSE programs, the two disorders are similar in terms of prevalence of drug treatment, perceived helpfulness of medication, occurrence of side effects, frequency of office visits, forgetting medication, problems with doctors and school personnel and unanswered questions about medication. They are also similar in frequency of physician approved dosage changes and administration of extra medication but for different reasons. Comparing HA to CD children, the HA received fewer drugs during the school year and fewer drug combinations, were more apt to have been referred, had more drug-free periods and more terminations of drug treatment, more HA children were placed on medication during school year, and more parents of HA children desired dosage changes. The people who were instrumental in referring and initiating drug-free periods also differ; the doctor was more apt to be involved in these procedures for CD children.

The drug regimen provides a number of reasons and opportunities for interaction among parents, teachers, and doctors. For example, it was estimated that 29.4% of the HA children were placed on medication during the school year, 26.9% were taken off drug treatment, 23.1% had a change in the type of medication, and an estimated 36.5% were placed on drug-free periods. Considering side effects, forgotten medication, noncompliance with physician directions, different opinions about therapeutic needs, desire for more information, and attitudes about dosage changes, there are ample opportunities for conflict as well.

Conclusions

(1) Interviewers described the parents as very cooperative and interested in the study. The mothers were prepared to answer the questions explained in the cover letter and were quite open about their child's problems and experiences with drug therapy.

(2) Drug identification was a simple task for the parent. The name of the drug was printed on 96.9% of the medicine containers. Only one parent could not recall or identify her child's medicine.

(3) The CMC was an effective research tool. Only 20.4% of the drugs were not pictured of which only 7.5% were not pictured in another dosage and/or form. The dosage/forms not pictured were liquids.

(4) The most frequently prescribed drugs for HA are stimulants which account for 61.1% of the total drug volume. Ritalin was administered to 61.5% of the children at some time during the school year. Excluding drugs prescribed prior to the most recent drug regimens and drugs administered only in the evening, the percent of drug use by drug category is as follows: stimulants (71.2%), major tranquilizers (9.6%), minor tranquilizers (7.9%), and other (13.5%).

(5) The most frequently prescribed drugs for CD are Dilantin, phenobarbital, and Mysoline which account for 67.7% of the total drug volume. At some time during the school year, 61.4% of the CD children received Dilantin, 56.8% phenobarbital, and 29.6% Mysoline. This pattern of drug use was similar for HA-CD children.

(6) For this sample, the use of major tranquilizers with HA children was 11.5% and 42.9% for HA-CD.

(7) Drug combinations were administered to 9.6% of the HA children, and for all but one the additional drug was for night sleep.

(8) Drug combinations were prescribed for 52.4% of the CD children; 21.5% received three or more drugs. Of those getting only one drug, 54.5% received phenobarbital and 22.7% Dilantin. Of the 22 children that got two or more drugs, the most frequent two-drug combinations were Dilantin and a barbiturate (9), Dilantin and Mysoline(6), and Mysoline and phenobarbital (3). All drug mentions for Valium and the succinimides (Zarontin and Celontin) were in combination with other drugs.

(9) Stimulants are typically administered two (43.5%) or three (28.3%) times per day. Excluding Cylert, for only 16.3% of the stimulant drug regimens were doses prescribed once a day. Of all the reported drug regimens for HA, 77% involve multiple daily doses.

(10) Of CD drug regimens, 91.6% are in divided dosages, 63.7% for three or more times per day.

(11) Most (95.7%) stimulant drug regimens involve a morning dose, 65.2% a noon dose, and 28.3% an evening dose. The percent of children that receive medication at the different times of day for the most recent drug regimens are as follows: morning (100.0%), noon (65.4%), afternoon (23.1%), supper (15.4%) and evening (42.3%).

(12) The general pattern for the different drug categories of anticonvulsants and time of administration is high (90% or more) morning and evening and moderate frequencies at noon (30-50%). The percent of children receiving medication at the different times of day are as follows: morning (95.3%), noon (51.2%), afternoon (25.6%), supper (18.6%), and evening (95.3%).

(13) The dosage range for Ritalin was 5-45 mg with a median dose of 15.0 mg/day. The dosage range for Dexedrine was 5-35 mg with a median dose of 16.5 mg/day. Median dose of Mellaril was 20.0 mg/day for HA children and 34.0 mg/day for HA-CD.

(14) Estimated median morning dose of Ritalin in milligrams per kilogram (mg/kg) is .30 mg/kg (range: .22-.82 mg/kg), and median daily dose was .70 mg/kg (range: .27-2.05 mg/kg). Dosages for Dexedrine were similar. For Mellaril, median morning dose was .56 mg/kg (range: .48-2.42 mg/kg) and median daily 1.12 mg/kg (range: .97-2.73 mg/kg).

(15) Side effects were reported by 46.2% of the parents for 47.3% of the drugs prescribed for HA. The percent of children reported experiencing side effects from Ritalin are as follows: suppressed appetite/weight loss (31.3%), insomnia (15.6%), mood changes (12.5%), and a depression-like reaction characterized by drowsiness, lethargy, sedation, and withdrawal (25.0%). Similar side effects were reported for Dexedrine. No attempt was made to assess duration or management of untoward reactions.

(16) Side effects were reported by 38.6% of the parents of CD children for 37.5% of the drugs. The percent of children reported experiencing side effects from Dilantin are as follows: gingival hyperlaspia (14.8%), gait ataxia (14.8%), Dilantin intoxication (11.1%), and drowsiness (11.1%). There was one reported case of hirsutism. For phenobarbital, the side effects were drowsiness (8.0%) and HA and/or mean-agressive (20.0%).

(17) Conservative estimates of the age at onset of drug treatment for HA and CD children on medication at the time of interview are 4.5 years and 2.2 years respectively. Estimates of duration of drug treatment are 12 months for HA children on medication (4.5 months for children off medication) and 30 months for CD.

(18) Half of the parents of HA children said that prior to drug treatment someone suggested their child should be examined by a physician and/or should inquire about the advisability of medication. Referrals were made by school personnel (public and private) for 21.1% of the children, 5.8% by public school teachers. A third of the children placed on medication during the school year were referred by school personnel.

(19) Only four of the CD parents said someone suggested their child should be examined by a physician and/or should inquire about the advisability of medication, three by a doctor and one by a relative. None of the four children placed on medication for CD during the school year were referred.

(20) Within the three months prior to the interview, 51.9% of the HA and 77.3% of the CD children had an office visit. For the previous six months the figures are 86.5% and 93.2% for HA and CD respectively.

(21) Drug-free periods had been arranged for 57.7% of the HA children, 70% within the last six months. (Duration of treatment for those who did was 12 months and nine months for those who did not.) Breaks in medication were initiated by parents (50.0%), doctors (35.7%), teacher (7.1%), and others (7.1%). Only three of the children did not receive medication the year round; two were off for the summer and one for weekends and holidays. Another child received a reduced dosage during summer.

(22) Thirteen (34.4%) of the parents of HA children on medication felt the dosage should be changed; eight wanted an increase to enhance therapeutic effect and five lowered to reduce side effects. Dosage changes were desired by eight (18.2%) of the parents of CD children to reduce side effects.

(23) Changes in the type of medication were made for 23.1% of the HA and 27.3% of the CD children. The most frequent reasons for change of medication with HA were side effects to include rebound effect, drug failure, and physician preference for another agent. For half of the CD children, the change involved a reduction in the number of drugs administered. The other drugs were terminated because of side effects and drug failure.

(24) By the close of the school year drug therapy had been terminated for 14 (26.9%) of the HA children. Reasons for termination were side effects (6), therapeutic improvement (4), tolerance for therapeutic benefits (4), and two were misdiagnosed according to the mother. Drug treatment was terminated for only two CD children.

(25) Parents of both HA (36.5%) and CD (27.3%) children said the doctor permitted them to change dosage if they thought their child needed more or less medication. Parents gave extra medication to HA children (26.9%) at special times, usually for situations perceived as exciting or stimulating, and to CD children (22.7%) usually for periods of fever or a "spell" of seizures.

(26) Problems with the doctor were reported by 16 (30.8%) parents of HA children and 10 (22.7%) parents of CD children. The most frequent complaints were poor rapport and the need for more information about medication and their child's disorder.

(27) Only 10 of the 110 parents interviewed reported problems with the school, mostly about the quality of educational services. Two parents reported conflicts over treatment modalities. The data did not support the lurid exposes of schools pushing drug therapy.

(28) The drug regimens for HA presented a number of opportunities for interaction among parents, teachers, and doctors. For example, it was estimated that 29.4% of the HA children were placed on medication during the school year, 26.9% were taken off medication, 23.1% had a change in the type of drug prescribed, and an estimated 36.5% received a drug-free period.

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Footnotes

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[3]The term mg/kg refers to medication in milligrams (1/28,000 of an ounce) per weight of the child in kilograms (2.2 lb.).

Table 1

Teacher Participation in Phase Three

(Teachers = 157)[a]

Category	Frequency	Percent
Not part of Phase Two[b]	1	0.6
Not permitted to participate in Phase Three[c]	8	5.1
Did not respond to Phase Two of the study	36	22.9
Did not respond to Phase Two of the study but participated in Phase Three[d]	2	1.3
Participated in both Phase Two and Phase Three	110	70.1
Total	157	100.0

[a]Total number of teachers who reported children receiving medication at some time during the school year.

[b]Responded too late to Phase One to be included in the other two phases.

[c]Administrative approval was not obtained for Phase Three.

[d]Failed to return Phase Two questionnaires but mailed parent permission letters.

Table 2

Children Available for Data Collection in Phase Three

(Children = 357)[a]

Category	Frequency	Percent
Not in Phase Two[b]	2	0.6
Not available for data collection in Phase Three[c]	18	5.0
Not included in Phase Two[d]	91	25.5
Available for data collection in Phase Three[e]	246	68.9
Total	357	100.0

[a]Number of children reported to have received medication at some time during the school year.

[b]Teacher responded too late to Phase One for children to be included in the other two phases.

[c]Administrative approval was not obtained for data collection in Phase Three.

[d]Teachers did not return medication questionnaires.

[e]Five children assumed to be included in Phase Three. (Two teachers did not return medication questionnaires, but parent permission letters were returned for at least one of the children they reported as receiving medication.)

Table 3

Reason Permission Letter Not Mailed from Indications on Permission Letter Logs[a]

(Parents = 33)[b]

Reason	Frequency	Percent
No phone in the home	4	12.1
Family moved or child withdrawn from school	9	27.3
Teacher considered the survey too sensitive a matter for a particular parent	6	18.2
Parent not capable of understanding the study and/or completing permission letter (low intelligence, could not read, etc.)	6	18.2
Other	4	12.1
Parent did not want to participate after discussion with teacher about study	4	12.1
Total	33	100.0

[a]Total number of teachers who returned permission letter logs was 110.

[b]Data was available on a total of 241 children.

Table 4

Parent Participation in Phase Three[a]

(Children = 246)[b]

Category	Frequency	Percent
Returned permission letters[c]	115	46.8
Family moved or child withdrawn from school	9	3.7
No phone in the home	4	1.6
Told teacher did not want to participate	4	1.6
Parents who did not receive permission letters because teachers considered them high risk	16	6.5
Did not return permission letters	98	39.8
Total	246	100.0

[a]Of the 112 teachers participating in Phase Three, 74 (66%) had at least one parent return a permission letter.

[b]Total number of children available for data collection in Phase Three.

[c]Because two parents did not have a telephone, 113 were usable.

Table 5

Medication Questionnaires Returned in Phase Two about Children Whose Parents Participated in Phase Three

Medication Questionnaire	Hyperactive (Children=52)		Hyperactive/ Convulsive (Children=14)		Convulsive (Children=44)		Convulsive/ Hyperactive (Children=14)	
	F	%	F	%	F	%	F	%
Hyperactivity	48[a]	92.3	9	64.3	1[b]	2.3	0	0.0
Convulsive Disorder	0	0.0	0	0.0	41	93.1	11	78.6
General[c]	3	5.8	0	0.0	1	2.3	0	0.0
Not Returned	1	1.9	1	7.1	1	2.3	1	7.1
Not mailed[d]	0	0.0	4	28.6	0	0.0	2	14.3
Total	52	100.0	14	100.0	44	100.0	14	100.0

[a]One child was characterized as receiving medication for both hyperactivity and epilepsy by the teacher.

[b]Teacher described child as having "minimal brain dysfunction, short attention span" while parent reported "EEG seizure activity."

[c]Based on reasons for medication obtained in Phase One, children were assigned to the general category for Phase Two.

[d]Child not identified as having disorder in Phase One.

Table 6

Description of Children[a]

(Children = 110)

Characteristic	Hyperactive (Children=52)		Convulsive (Children=44)		Hyperactive/ Convulsive (Children=14)		Total (Children=110)	
	F	%	F	%	F	%	F	%
Sex								
Male	44	84.6	26	59.1	11	78.6	81	73.6
Female	8	15.4	18	40.9	3	21.4	29	26.4
Age in months								
36 - 47	3	5.8	9	20.5	0	0.0	12	10.9
48 - 59	16	30.8	18	40.9	3	21.4	37	33.6
60 - 71	22	42.3	11	25.0	6	42.9	39	35.5
72 - 83	9	17.3	6	13.6	4	28.6	19	17.3
84 - and above	2	3.8	0	0.0	1	7.1	3	2.7
On/off medication when surveyed								
On	34	65.4	42	95.5	14[b]	100.0	90	81.8
Off	18	34.6	2	4.5	0	0.0	20	18.2
Race[c]	(Children=51)		(Children=44)		(Children=13)		(Children=108)	
White	48	96.1	42	95.4	13	100.0	104	96.3
Black	2	3.9	1	2.3	0	0.0	3	2.8
Other	0	0.0	1	2.3	0	0.0	1	.9

[a]The two children who received medication for other disorders are omitted.

[b]At time of interview, eight were receiving medication for both disorders, one was receiving medication for hyperactivity only, and five were receiving medication for convulsive disorders only.

[c]Calculated from medication questionnaires in Phase Two. Smaller n's indicate missing data.

Table 8

Most Frequently Reported Drug Forms

Trade Name[a]	Form	Dosage[b]	Frequency	Percent
Dilantin Infatabs	tablet	50 mg	33	14.7
Ritalin	tablet	5 mg	27	12.0
phenobarbital	tablet	15 mg	13	5.8
Mysoline	tablet	50 mg	9	4.0
phenobarbital*	liquid	20 mg/5 cc	9	4.0
phenobarbital	tablet	30 mg	9	4.0
Ritalin	tablet	10 mg	9	4.0
Mellaril	tablet	10 mg	8	3.6
Valium	tablet	2 mg	8	3.6
Tofranil	tablet	10 mg	7	3.1
Cylert*	tablet	37.5 mg	5	2.2
Mebaral	tablet	32 mg	5	2.2
Mysoline	tablet	250 mg	5	2.2
Atarax Syrup*	liquid	10 mg/5 cc	4	1.8
Pediatric-Dilantin-30 Suspension*	liquid	30 mg/5 cc	4	1.8
Valium	tablet	5 mg	4	1.8
Celontin Kapseals	capsule	150 mg	3	1.3
Dexedrine	tablet	5 mg	3	1.3
Dexedrine Elixir*	liquid	5 mg/5 cc	3	1.3
Diamox	tablet	250 mg	3	1.3
Mebaral	tablet	50 mg	3	1.3
Tegretol	tablet	200 mg	3	1.3
Vistaril Oral Suspension*	liquid	25 mg/5 cc	3	1.3
Other			45	20.0
Total			225	100.0

[a]All are trade names with the exception of phenobarbital. Asterisk (*) indicates a drug form not pictured in the Children's Medication Chart.

[b]Dosages for tablets and capsules are in milligrams (mg); liquids are in mg per teaspoon (5cc), and ¼ grain (gr) and ½ gr dosages for phenobarbital were converted to 15 mg and 30 mg respectively.

Table 9

Drugs Reportedly Used in the Management of Hyperactivity[a]

(Children = 52)[b]

	Generic Name	Trade Name	Frequency[c]	Percent[d]
1.	Stimulants		(44)	(61.1)
	methylphenidate hydrochloride	Ritalin	32	61.5
	dextroamphetamine sulfate	Dexedrine	7	13.5
	pemoline	Cylert	3	5.8
	deanol	Deaner	2	3.8
2.	Major Tranquilizers		(6)	(11.5)
	thioridazine	Mellaril	6	11.5
3.	Minor Tranquilizers		(9)	(12.5)
	diazepam	Valium	3	5.8
	hydroxyzine hydrochloride	Atarax	2	3.8
	hydroxyzine pamoate	Vistaril	3	5.8
	meprobamate	Equanil	1	1.9
4.	Antidepressants		(4)	(5.5)
	imipramine hydrochloride	Tofranil	3	5.8
	nortriptyline hydrochloride	Aventyl	1	1.9
5.	Anticonvulsants		(3)	(4.2)
	pheyntoin	Dilantin	2	3.8
	phensuximide	Milontin	1	1.9
6.	Hypnotics & Sedatives		(2)	(2.8)
	phenobarbital		2	3.8
7.	Miscellaneous		(4)	(5.6)
	diphenhydramine hydrochloride	Benadryl	2	3.8
		Dexamyl[e]	2	3.8
Total[f]			72	138.2

[a]Tabulated from parent interviews.
[b]Number of children reported to have received drug treatment for hyperactivity. Three of these children also received psychotropic drugs for sleep problems.
[c]Numbers in parentheses represent values for drug categories.
[d]Percentages for drug categories are based on total number of drugs.
[e]Combination of dextroamphetamine sulfate and amobarbital.
[f]Totals are inflated because 15 children received more than one drug for hyperactivity during the school year.

Table 10

Drugs Reportedly Used for Hyperactivity with Children Who Also Received Drug Therapy for Convulsive Disorders[a]

(Children = 14)[b]

Generic Name	Trade Name	Frequency[c]	Percent[d]
1. Stimulants		(7)	(28.0)
methylphenidate hydrochloride	Ritalin	4	28.6
pemoline	Cylert	2	14.3
deanol	Deaner	1	7.1
2. Major Tranquilizers		(9)	(36.0)
thioridazine	Mellaril	6	42.9
chlorpromazine	Thorazine	2	14.3
trifluoperazine	Stelazine	1	7.1
3. Minor Tranquilizers		(3)	(12.0)
diazepam	Valium	2	14.3
chlordiazepoxide	Librium	1	7.1
4. Antidepressants		(4)	(16.0)
imipramine hydrochloride	Tofranil	4	28.6
5. Anticonvulsants		(2)	(8.0)
phenytoin	Dilantin	2	14.3
Total[e]		25	178.6

[a]Tabulated from parent interviews.

[b]Number of children who received drug therapy for both hyperactivity and convulsive disorders at some time during the school year.

[c]Numbers in parentheses represent values for drug categories.

[d]Percentages for drug categories are based on total number of drugs.

[e]Totals are inflated because four children received more than one drug for hyperactivity during the school year.

Table 11

Drugs Reportedly Used in the Management of Convulsive Disorders[a]

(Children = 44)[b]

Generic Name	Trade Name	Frequency[c]	Percent[d]
1. Anticonvulsants		(51)	(53.1)
phenytoin	Dilantin, Ekko	27	61.4
primidone	Mysoline	13	29.6
acetazolamide	Diamox	4	9.1
methsuximide	Celontin	3	6.8
ethosuximide	Zarontin	3	6.8
mephenytoin	Mesantoin	1	2.3
2. Hypnotics & Sedatives		(33)	(34.4)
phenobarbital		25	56.8
mephobarbital	Mebaral	6	13.6
metharbital	Gemonil	2	4.6
3. Tranquilizers (Major & Minor)		(7)	(7.3)
diazepam	Valium	6	13.6
clorazepate dipotassium	Tranxene	1	2.3
4. Miscellaneous		(5)	(5.2)
carbamazepine	Tegretol	2	4.6
hydrocortisone	Cortef	1	2.3
ACTH		1	2.3
imipramine hydrochloride	Tofranil	1	2.3
Total[e]		96	218.2

[a]Tabulated from parent interviews.

[b]Number of children reported to have received drug therapy for convulsive disorders.

[c]Numbers in parentheses represent values for drug categories.

[d]Percentages for drug categories are based on total number of drugs.

[e]Totals are inflated because 27 children received more than one drug for convulsive disorders during the school year.

Table 12

Drugs Reportedly Used for Convulsive Disorders with Children Who Also Received Drug Therapy for Hyperactivity[a]

(Children = 14)[b]

Generic Name	Trade Name	Frequency[c]	Percent[d]
1. Anticonvulsants		(10)	(50.0)
phenytoin	Dilantin	7	50.0
methsuximide	Celontin	2	14.3
primidone	Mysoline	1	7.1
2. Hypnotics & Sedatives		(8)	(40.0)
phenobarbital		6	42.9
mephobarbital	Mebaral	2	14.3
3. Tranquilizers (Major & Minor)		(1)	(5.0)
clorazepate dipotassium	Tranxene	1	7.1
4. Miscellaneous		(1)	(5.0)
carbamazepine	Tegretol	1	7.1
Total[e]		20	142.8

[a]Tabulated from parent interviews.

[b]Number of children who received drug therapy for both convulsive disorders and hyperactivity at some time during the school year.

[c]Numbers in parentheses represent values for drug categories.

[d]Percentages for drug categories are based on total number of drugs.

[e]Totals are inflated because four children received more than one drug for convulsive disorders during the school year.

Table 13

Number of Reported Drugs per Child by Disorder[a]

(Children=110)[b]

Number of Medications	Hyperactive (Children=52)		Convulsive (Children=44)		Hy Co (Ch
	F	%	F	%	F
1	36	69.2	17	38.6	1
2	11	21.2	14	31.8	5
3	3	5.8	6	13.6	4
4	0	0.0	3	6.8	1
5	1	1.9	2	4.5	1
6	1	1.9	0	0.0	1
7	0	0.0	0	0.0	0
8	0	0.0	2	4.5	1
Total[c]	52	100.0	44	99.8	14

[a]Includes all drugs reportedly received at some time during the school year.

[b]Total number of drugs = 225.

[c]Due to rounding error, percentages sum to less than 100.0%.

Table 14

Multiple Drug Administrations

(Children = 100)

Number of Medications	Hyperactive (Children=52)		Convulsive (Children=44)		Hyperactive/ Convulsive (Children=14)		Total (Children=110)	
	F	%	F	%	F	%	F	%
Children Actively Receiving Medication at Time of Survey								
1	30	88.2	20	47.6	7	50.0	57	63.3
2	3	8.8	13	30.9	5	35.7	21	23.3
3	0	0.0	7	16.7	2	14.3	9	10.0
4	1	2.9	1	2.4	0	0.0	2	2.2
5	0	0.0	1	2.4	0	0.0	1	1.1
Total[a]	34	99.9	42	100.0	14	100.0	90	99.9
Children Not Actively Receiving Medication at Time of Survey								
1	17	94.4	2	100.0	0	0.0	19	95.0
2	1	5.6	0	0.0	0	0.0	1	5.0
Total	18	100.0	2	100.0	0	0.0	20	100.0

[a]Due to rounding error, percentages sum to less than 100.0%.

Table 15

Frequency of Daily Drug Administrations for Hyperactivity[a]

(Children = 52)

Drug	Dosage[b]	Number of Administrations 1	2	3	≥ 4	Total[c]
1. Stimulants						
Ritalin	5	4	13	4	2	23
Ritalin	10	1	3	5	0	9
Ritalin	20	0	0	1	0	1
Dexedrine	5	1	3	2	0	6
Dexedrine	10	0	1	1	0	2
Cylert	37.5	3	0	0	0	3
Deaner	100	1	0	0	1	2
Total[d]		10(21.7)	20(43.5)	13(28.3)	3(6.5)	46
2. Major Tranquilizers						
Mellaril	10	0	4	0	0	4
Mellaril	15	0	0	1	0	1
Mellaril	50	1	0	0	0	1
Total		1(16.7)	4(66.6)	1(16.7)	0(0.0)	6
3. Minor Tranquilizers						
Atarax	10	0	0	1	1	2
Equanil	200	0	0	0	1	1
Valium	2	0	0	1	0	1
Valium	5	1	0	0	1	2
Vistaril	25	1	0	2	0	3
Total		2(22.2)	0(0.0)	4(44.5)	3(33.3)	9
4. Antidepressants						
Tofranil	10	1	1	1	0	3
Aventyl	10	0	0	1	0	1
Total		1(25.0)	1(25.0)	2(50.0)	0(0.0)	4
5. Other		3(33.3)	4(44.5)	1(11.1)	1(11.1)	9
Grand Total[e]		17(23.0)	29(39.2)	21(28.4)	7(9.5)	74

[a]Tabulated from parent interviews.
[b]Dosage in milligrams.
[c]Number of children who received drug.
[d]Numbers in parentheses are percent of total.
[e]Total is inflated because 15 children received more than one drug for hyperactivity during the school year. Percentages are based on the total number of drug regimens, 74.

Table 16

Frequency of Daily Drug Administrations for Convulsive Disorders[a]

(Children = 52)

Drug	Dosage[b]	Number of Administrations				Total[c]
		1	2	3	≥ 4	
1. Anticonvulsants						
Dilantin	50	1	12	6	3	22
Dilantin	30	0	2	1	1	4
Ekko	100	0	1	0	0	1
Mysoline	50	1	1	4	1	7
Mysoline	250	0	2	4	0	6
Diamox	125	0	0	1	0	1
Diamox	250	0	2	1	0	3
Celontin	150	0	2	0	0	2
Celontin	300	1	0	0	0	1
Zarontin	250	1	2	0	0	3
Mesantoin		0	1	0	0	1
Total[d]		4(7.9)	25(49.0)	17(33.3)	5(9.8)	51
2. Hypnotics & Sedatives						
phenobarbital	15	1	2	4	4	11
phenobarbital	20	1	1	5	2	9
phenobarbital	30	1	2	2	0	5
Mebaral	32	0	3	1	0	4
Mebaral	50	0	0	1	1	2
Gemonil	100	0	0	1	1	2
Total		3(9.1)	8(24.2)	14(42.4)	8(24.2)	33
3. Miscellaneous						
Cortef	5	0	0	1	0	1
Tegretol	200	0	0	1	1	2
Tofranil	10	1	0	0	0	1
Tranxene	3.75	0	0	1	0	1
Valium	2	0	2	1	2	5
[illegible]um	5	0	1	0	0	1
Total		1(9.1)	3(27.3)	4(36.4)	3(27.3)	11
Grand Total[e]		8(8.4)	36(37.9)	35(36.8)	16(16.8)	95

[a]Tabulated from parent interviews.
[b]Dosage in milligrams.
[c]Number of children who received drug.
[d]Numbers in parentheses are percent of total.
[e]Totals are inflated because 27 children received more than one drug for convulsive disorders during the school year. Percentages are based on the total number of drug regimens, 95.

Table 17

Time of Day Drug Administered for Hyperactivity[a]

(Children = 52)

Drug[b]	Dosage[c]	Time of Day					
		Morning	Noon	Afternoon	Supper	Evening	Total[d]
1. Stimulants							
Ritalin (n=23)	5	22	14	4	3	8	51
Ritalin (n=9)	10	9	8	3	1	1	22
Ritalin (n=1)	20	1	1	0	1	0	3
Dexedrine (n=6)	5	6	4	1	0	2	13
Dexedrine (n=2)	10	2	2	0	0	1	5
Cylert (n=3)	37.5	3	0	0	0	0	3
Deaner (n=2)	100	1	1	1	2	1	6
Total (n=46)[e]		44(95.7)	30(65.2)	9(19.6)	7(15.2)	13(28.3)	103
2. Major Tranquilizers							
Mellaril (n=4)	10	4	1	0	0	3	8
Mellaril (n=1)	15	1	1	0	0	1	3
Mellaril (n=1)	50	1	0	0	0	0	1
Total (n=6)		6(100.0)	2(33.3)	0(0.0)	0(0.0)	4(66.7)	12
3. Minor Tranquilizers							
Atarax (n=2)	10	2	2	1	0	2	7
Equanil (n=1)	200	1	1	0	1	0	3
Valium (n=1)	2	1	1	0	0	1	3
Valium (n=2)	5	1	1	0	1	2	5
Vistaril (n=3)	25	2	1	1	0	3	7
Total (n=9)		7(77.8)	6(66.7)	2(22.2)	2(22.2)	8(88.9)	25
4. Antidepressants							
Tofranil (n=3)	10	3	1	1	1	0	6
Aventyl (n=1)	10	1	1	0	0	1	3
Total (n=4)		4(100.0)	2(50.0)	1(25.0)	1(25.0)	1(25.0)	9
5. Other (n=9)		6(66.7)	2(22.2)	1(11.1)	1(11.1)	8(88.9)	18
Grand Total[f]		67(40.1)	42(25.1)	13(7.8)	11(6.6)	34(20.4)	167

[a]Tabulated from parent interviews.
[b]n = number of children that reportedly received drug dosage form.
[c]Dosage in milligrams.
[d]Total number of drug administrations.
[e]Numbers in parentheses are the percentage of children that received medication by time of day.
[f]Numbers in parentheses are the percentage of total drug administrations by time of day.

Table 18

Time of Day Drug Administered for Convulsive Disorders[a]

(Children = 44)

Drug[b]	Dosage[c]	Time of Day					
		Morning	Noon	Afternoon	Supper	Evening	Total[d]
1. Anticonvulsants							
Dilantin (n=22)	50	21	7	3	3	21	55
Dilantin (n=4)	30	4	2	0	1	4	11
Ekko (n=1)	100	1	0	0	0	1	2
Mysoline (n=7)	50	7	4	0	3	5	19
Mysoline (n=6)	250	6	4	0	0	6	16
Diamox (n=1)	125	1	1	0	0	1	3
Diamox (n=3)	250	2	0	0	0	3	5
Celontin (n=2)	150	2	0	0	0	2	4
Celontin (n=1)	300	1	0	0	0	0	1
Zarontin (n=3)	250	3	0	0	0	2	5
Mesantoin (n=1)		1	0	0	0	1	2
Total (n=51)[e]		49(96.1)	18(35.3)	3(5.9)	7(13.7)	46(90.2)	123
2. Hypnotics & Sedatives							
phenobarbital (n=11)	15	10	7	3	3	10	33
phenobarbital (n=7)[f]	20	6	3	3	1	6	19
phenobarbital (n=5)	30	4	1	1	0	5	11
Mebaral (n=4)	32	4	0	1	0	4	9
Mebaral (n=2)	50	2	2	1	0	2	7
Gemonil (n=2)	100	2	2	0	2	1	7
Total (n=31)		28(90.3)	15(48.4)	9(29.0)	6(19.4)	28(90.3)	86
3. Other							
Cortef (n=1)	5	1	1	0	0	1	3
Tegretol (n=2)	200	2	1	1	1	2	7
Tofranil (n=1)	10	0	0	0	0	1	1
Tranxene (n=1)	3.75	1	1	0	0	1	3
Valium (n=5)[g]	2	5	3	1	2	5	16
Valium (n=1)	5	1	0	1	0	0	2
Total (n=11)		10(90.9)	6(54.5)	3(27.3)	3(27.3)	10(90.9)	32
Grand Total[h]		87(36.1)	39(16.2)	15(6.2)	16(6.6)	84(34.9)	241

[a]Tabulated from parent interviews.
[b]n=number of children who received drug.
[c]Dosage in milligrams.
[d]Number of drug administrations.
[e]Numbers in parentheses are the percentage of children that received medication by time of day.
[f]Excluded are two children for whom drug was prescribed as needed.
[g]Excluded is one child for whom drug was prescribed as needed.
[h]Numbers in parentheses are the percentage of total drug administrations by time of day.

Table 19

Daily Dosage of Drugs Used for the Management of Hyperactivity[a]

(Children=52)

Drug	Frequency	Dosage Range	Median	Mean
Ritalin	33	5 - 45	15.0	17.2
Dexedrine	8	5 - 35	16.5	18.9
Mellaril	6	20 - 50	20.0	29.2
Cylert	3	19 - 38	28.0	28.3
Tofranil	3	10 - 30	20.0	20.0
Valium	3	6 - 20	13.0	13.0
Vistaril	3	25 - 150	50.0	83.3
Atarax	2	30 - 50	40.0	40.0
Benadryl	2	25 - 100	62.5	62.5
Deaner	2	200 - 600	400.0	400.0
Dexamyl	2	20	20.0	20.0
Dilantin	2	75 - 150	112.5	112.5
phenobarbital	2	30 - 48	39.0	39.0
Aventyl	1	30	30.0	30.0
Equanil	1	150	150.0	150.0
Milontin	1	450	450.0	450.0

[a]Tabulated from parent interviews.

Table 20

Daily Dosages of Drugs Used for the Management of Hyperactivity in Children with Convulsive Disorders[a]

(Children = 14)[b]

Drug	Frequency	Dosage Range	Median	Mean
Mellaril	6	30 - 90	34.0	46.3
Ritalin	4	5 - 15	10.0	10.0
Tofranil	4	10 - 30	17.5	18.8
Mylert	2	37 - 75	56.0	56.0
Dilantin	2	100 - 175	137.5	137.5
Thorazine	2	20 - 30	25.0	25.0
Valium	2	8 - 15	11.5	11.5
Deaner	1	100	100.0	100.0
Librium	1	20	20.0	20.0
Stelazine	1	8	8.0	8.0

[a]Tabulated from parent interviews.

[b]Children received drug therapy for both hyperactivity and convulsive disorders at some time during the school year.

Table 21

Daily Dosage of Drugs Used for the Management of Convulsive Disorders[a]

(Children=44)

Drug	Frequency	Dosage Range	Median	Mean
Dilantin	27	25 - 200	100.0	108.0
phenobarbital	25	10 - 160	60.0	58.4
Mysoline	13	50 - 750	300.0	309.6
Mebaral	6	64 - 200	96.0	111.7
Valium	6	4 - 14	6.5	7.5
Diamox	4	187 - 750	250.0	359.3
Celontin	3	300 - 333	300.0	311.0
Zarontin	3	250 - 750	500.0	500.0
Gemonil	2	150 - 200	175.0	175.0
Tegretol	2	400	400.0	400.0
ACTH[b]	1			
Cortef	1	75	75.0	75.0
Mesantoin	1	100	100.0	100.0
Tofranil	1	10	10.0	10.0
Tranxene	1	11	11.0	11.0

[a]Tabulated from parent interviews.

[b]Series of intramuscular injections.

Table 22

Daily Dosages of Drugs Used for the Management of Convulsive Disorders in Children with Hyperactivity[a]

(Children = 14)[b]

Drug	Frequency	Dosage Range	Median	Mean
Dilantin	7	50 - 200	100.0	107.1
phenobarbital	6	45 - 240	77.5	98.3
Celontin	2	300 - 666	483.0	483.0
Mebaral	2	96 - 150	123.0	123.0
Mysoline	1	75	75.0	75.0
Tegretol	1	400	400.0	400.0
Tranxene	1	8	8.0	8.0

[a]Tabulated from parent interviews.

[b]Children received drug therapy for both convulsive disorders and hyperactivity at some time during the school year.

Table 23

Number of Drugs Terminated Prior to the Most Recent Drug Regimen[a]

(Children = 110)

Number of Medications	Hyperactive[b] (Children=13)		Convulsive (Children=12)		Hyperactive/ Convulsive (Children=9)		Total (Children=34)	
	F	%	F	%	F	%	F	%
1	9	69.2	7	58.3	4	44.4	20	58.8
2	3	23.1	3	25.0	2	22.2	8	23.5
3	0	0.0	0	0.0	0	0.0	0	0.0
4	1	7.7	1	8.3	1	11.1	3	8.8
5	0	0.0	0	0.0	1	11.1	1	3.0
6	0	0.0	1	8.3	1	11.1	2	5.9
Total	13	100.0	12	100.0	9	100.0	34	100.0

[a] Number of drugs child received during the school year prior to the medication being administered at time of parent interview, or, if drug therapy was already terminated, other drugs received prior to most recent drug regimen.

[b] Includes four children who were not on medication at time of survey. Each reported one terminated drug prior to the medication received when drug therapy was terminated.

Table 24

Reason for Terminating Individual Drugs[a]

Reason[b]	Hyperactive (Drugs=38)		Hyperactive/ Convulsive (Drugs=18)		Convulsive (Drugs=25)		Convulsive/ Hyperactive (Drugs=5)		Total[c]	
	F	%	F	%	F	%	F	%	F	%
Side effects	15	39.5	8	44.4	13	52.0	3	60.0	39	45.3
Drug not effective	6	15.8	5	27.8	6	24.0	2	40.0	19	22.1
Aggrevated problem	2	5.3	1	5.6	0	0.0	1	20.0	4	4.7
Drug-free period	4	10.5	0	0.0	0	0.0	0	0.0	4	4.7
Misdiagnosed	3	7.9	2	11.1	0	0.0	0	0.0	5	5.8
Child improved therapeutically	4	10.5	1	5.6	3	12.0	0	0.0	8	9.3
Doctor preferred another drug	4	10.5	1	5.6	0	0.0	0	0.0	5	5.8
Developed tolerance to therapeutic response	4	10.5	0	0.0	0	0.0	0	0.0	4	4.7
Rebound effect	3	7.9	0	0.0	0	0.0	0	0.0	3	3.5
Drug interaction	0	0.0	1	5.6	0	0.0	2	40.0	3	3.5
Uncertain	0	0.0	1	5.6	0	0.0	0	0.0	1	1.2
Wasn't necessary	0	0.0	0	0.0	1	4.0	0	0.0	1	1.2
Other	3	7.9	0	0.0	3	12.0	0	0.0	6	7.0
Total[d]	48	126.3	20	111.3	26	104.0	8	160.0	102	118.8

[a]Tabulated from parent interviews.

[b]The number of children are 27, 8, 14, and 3 for each of the four categories of disorders respectively.

[c]Percentages are based on a total of 86 drugs.

[d]Totals are inflated because some parents reported more than one reason for terminating drug.

Table 25

Reason for Terminating Drug Treatment[a]

Reason	Hyperactive (Children=18)		Hyperactive/ Convulsive (Children=5)		Consulsive (Children=2)		Convulsive/ Hyperactive (Children=1)		Total[b]	
	F	%	F	%	F	%	F	%	F	%
Side effects	6	33.3	3	60.0	1[c]	50.0	0	0.0	10	38.5
Drug-free period	4	22.2	0	0.0	0	0.0	0	0.0	4	15.4
Aggrevated problem	2	11.1	0	0.0	0	0.0	1[d]	100.0	3	11.5
Child improved therapeutically	4	22.2	2	40.0	1	50.0	0	0.0	7	26.9
Misdiagnosed	2	11.1	0	0.0	0	0.0	0	0.0	2	7.7
Developed tolerance to therapeutic response	4	22.2	0	0.0	0	0.0	0	0.0	4	15.4
Drug not effective	1	5.6	1	20.0	0	0.0	0	0.0	2	7.7
Drug interaction	0	0.0	1	20.0	0	0.0	0	0.0	1	3.8
Total[e]	23	127.7	7	140.0	2	100.0	1	100.0	33	126.9

[a]Tabulated from parent interviews.

[b]Percentages based on a total of 26 children.

[c]Treated for subclinical grand mal seizures, but drug caused child to become hyperactive.

[d]Child treated with anticonvulsant drug for headaches.

[e]Total percentages are inflated because some parents reported more than one reason for termination of drug therapy.

Table 26

Estimated Age at Onset and Estimated Duration of Drug Treatment[a]

Item	Hyperactive (Children=52)	Hyperactive/ Convulsive (Children=14)	Convulsive (Children=43)[b]	Convulsive/ Hyperactive (Children=14)
Age at onset of drug treatment (months)[c]	(Children=34)	(Children=9)	(Children=41)	(Children=11)
Range	12 - 87	16 - 68	1 - 69	3 - 64
Median	54.0	55.0	26.0	38.0
Mean	49.8	51.8	29.2	37.0
Age at end of school year (months)	(Children=34)	(Children=9)	(Children=41)	(Children=11)
Range	45 - 102	54 - 74	42 - 81	54 - 88
Median	66.0	71.0	58.0	67.0
Mean	66.0	67.8	57.9	68.5
Duration of drug treatment (months)[d]	(Children=34)	(Children=9)	(Children=41)	(Children=13)
Range	33 - 66	6 - 48	4 - 61	6 - 64
Median	12.0	12.0	30.0	25.0
Mean	16.2	16.0	28.7	28.9
Duration of drug treatment (months)[e]	(Children=18)	(Children=5)	(Children=2)	(Children=1)
Range	1 - 29	1 - 30	1 - 36	1
Median	4.5	6.0	18.5	1
Mean	8.0	8.8	18.5	1

[a]Calculated from drugs reportedly received during the school year. Children may have received medication prior to the onset of reported drugs.

[b]Data not available for one child.

[c]Calculated by subtracting duration of treatment from age at end of school year. Data not available for children not actively receiving medication.

[d]Children actively receiving medication at end of school year.

[e]Children not actively receiving medication at end of school year.

Table 27

Efficacy and Problems with Medication[a]

Item	Hyperactive (Children=52)		Hyperactive/Convulsive (Children=14)	
	F	%	F	%
Does (did) the medication help your child?				
Yes	44	84.6	12	85.7
No	7	13.5	1	7.1
Uncertain	1	1.9	1	7.1
Have (did) you had (have) any problems with the medication? Did the medication do anything you didn't want it to?				
Yes	28	53.8	5	35.7
No	24	46.2	9	64.3
Problems encountered:	(Children=28)		(Children=5)	
Side effects	24	85.6	5	100.0
Not effective	1	3.6	0	0.0
Wasn't necessary	1	3.6	0	0.0
Drug interaction	1	3.6	0	0.0
Developed tolerance to therapeutic response	1	3.6	0	0.0

[a]Tabulated from parent interviews.

Table 28

Parent Perception of Therapeutic Benefits of Drug Treatment for Hyperactivity[a]

Response Category[b]	Hyperactive (Children=43)[c]		Hyperactive/Convulsive (Children=12)	
	F[d]	%	F	%
Hyperactivity	(39)	(37.9)	(6)	(27.3)
Less motor activity (restlessness)	9	20.9	2	16.7
Sit still longer	11	25.6	2	16.7
More calm	13	30.2	1	8.3
Slowed down	6	14.0	1	8.3
Manageability	(12)	(11.6)	(5)	(22.7)
Easier to control	3	7.0	3	25.0
More reasonable[e]	6	14.0	1	8.3
Better self control	2	4.7	0	0.0
Less mischief	1	2.3	1	8.3
Attention	(9)	(8.7)	(5)	(22.7)
Attends for longer periods	5	11.6	3	25.0
Pays attention better	4	9.3	2	16.7
Temperment	(8)	(7.8)	(0)	(0.0)
Less emotional (crying, screaming, temper tantrums)	5	11.6	0	0.0
Less frustrated	2	4.7	0	0.0
Happier	1	2.3	0	0.0
Social	(6)	(5.8)	(0)	(0.0)
Less aggressive	3	7.0	0	0.0
Plays better	2	4.7	0	0.0
Improved peer relations	1	2.3	0	0.0
Sleep	(4)	(3.9)	(2)	(9.1)
More normal sleep cycle	2	4.7	1	8.3
Sleeps better	2	4.7	1	8.3
Miscellaneous	(25)	(24.3)	(4)	(18.2)
Better concentration	4	9.3	0	0.0
Improved school performance	3	7.0	0	0.0
Less destructive	3	7.0	0	0.0
More relaxed	2	4.7	0	0.0
Finishes tasks better	2	4.7	0	0.0

Table 28 (Continued)

Parent Perception of Therapeutic Benefits of Drug Treatment for Hyperactivity[a]

Response Category[b]	Hyperactive (Children=43)[c]		Hyperactive/Convulsive (Children=12)	
	F[d]	%	F	%
Less impulsive	1	2.3	0	0.0
Less distractable	1	2.3	0	0.0
Other	9	20.9	4	33.3
Total[f]	(103)	(100.0)	(22)	(100.0)

[a]Responses were prompted by asking the mother why she felt the medication had helped her child. Responses for only those parents who perceived the medication as having a beneficial effect are recorded.

[b]Percentages for each item are based on the total number of children.

[c]Response for one child was not recorded.

[d]Numbers in parentheses are the values for the response categories. Percentages are based on the total number of responses, 103 and 22 for hyperactive and hyperactive-convulsive children respectively.

[e]Characteristic response was, "I could get through to him/her."

[f]Parents were permitted multiple responses.

Table 29

Parent Perception of Therapeutic Response

Item	Hyperactive[a] (Children=52)		Hyperactive/Convulsive (Children=14)	
	F	%	%	%
Was your child hyperactive (overactive) before taking medicine?				
Yes	47(36)	90.4(94.7)	13	92.9
No	4(2)	7.7(5.3)	1	7.1
Uncertain	1(0)	1.9(0.0)	0	0.0
Has (did) the medication reduce your child's hyperactivity?	(Children=47)		(Children=13)	
Yes	42(33)	89.4(91.7)	11	84.6
No	3(2)	6.4(2.8)	1	7.7
Uncertain	2(1)	4.2(5.5)	1	7.7
Has (did) the medication helped your child pay better attention to what s/he is doing?				
Yes	43(35)	82.7(92.1)	12	85.7
No	8(2)	15.4(5.3)	2	14.3
Uncertain	1(1)	1.9(2.6)	0	0.0
Has (did) the medication helped your child follow directions?				
Yes	37(29)	71.1(76.3)	12	85.7
No	11(6)	21.2(15.8)	2	14.3
Uncertain	4(3)	7.7(7.9)	0	0.0
Has (did) the medication helped your child get along with other children better?				
Yes	32(26)	61.5(68.4)	11	78.6
No	14(6)	21.2(15.8)	2	14.3
Uncertain	6(6)	11.6(15.8)	1	7.1
Does (did) your child tend to finish things s/he starts better than s/he did before receiving medication?				
Yes	34(29)	65.4(76.3)	10	71.4
No	13(5)	25.0(13.2)	2	14.3
Uncertain	5(4)	9.6(10.5)	2	14.3

[a]Number in parentheses are the values for the 34 children on medication at time of interview plus the four who were placed on drug-free periods.

Table 32

Parent Referral to Physician[a]

Item	Hyperactive (Children=52)		Hyperactive/Convulsive (Children=14)	
	F	%	F	%
Did anyone help you decide to see a doctor to see if medication would help your child?				
Yes	26	50.0	7	50.0
No	26	50.0	7	50.0
Who helped you decide?	(Children=26)		(Children=7)	
School Personnel	(11)	(42.3)	(3)	(42.9)
teacher	3	11.5	1	14.3
private school teacher	2	7.7	0	0.0
private school administrator	0	0.0	1	14.3
speech therapist	1	3.8	0	0.0
school psychologist	4	15.4	1	14.3
diagnostic center	1	3.0	0	0.0
Medical Personnel	(12)	(46.2)	(4)	(57.1)
physician	9	34.6	1	14.3
diagnostic center	0	0.0	2	28.6
public aide nurse	2	7.7	0	0.0
county health nurse	1	3.8	0	0.0
mother's psychiatrist	0	0.0	1	14.3
Other	(5)	(19.2)	(0)	(0.0)
private psychologist	1	3.8	0	0.0
mother's psychologist	1	3.8	0	0.0
relative	1	3.8	0	0.0
minister	1	3.8	0	0.0
Sunday school teacher	1	3.8	0	0.0
Total[b]	(28)	(107.7)	(7)	(100.0)

[a] Tabulated from parent interviews.

[b] Totals are inflated because two parents of hyperactive children reported more than one referral source.

Table 33

Temporary Break in Medication to Assess Therapeutic Resp

Item	Hyperactive (Children=34)		Hyperactive/ Convulsive (Children=9)	
	F	%	F	%
Was your child taken off medication for a while to see if the medication was still needed to help your child?	Children on Medication			
Yes	17[a]	50.0	2	22.2
No	17	50.0	7[c]	77.8
Did anyone suggest break in medication?	(Children=17)		(Children=1)[d]	
Yes	7	41.2	1	100.0
No	10[f]	58.8	0	0.0
Who suggested break in medication?	(Children=7)		(Children=1)	
Doctor	4	57.1	1	100.0
Teacher	2	28.6	0	0.0
Clinical psychologist	1	14.3	0	0.0
Relative	0	0.0	0	0.0
How long ago was this break? (months)[h]	(Children=16)[i]		(Children=2)	
1 - 3	5	31.2	0	0.0
4 - 6	5	31.2	0	0.0
7 - 9	1	6.3	0	0.0
10 - 12	3	18.8	1	50.0
13 or more	2	12.5	1	50.0

[a]One child received break in medication (Mellaril) so virus infection could be
[b]Four of these children were actually on a break in drug therapy, three for the
[c]For one child, physician suggested break in medication but parent refused.
[d]Data not available for one child.
[e]Data not available for two children.
[f]For two children parent suggested break in medication and physician acquiesced
[g]For one child parent suggested break in medication and physician acquiesced.
[h]For two children break in medication was followed by a new drug.
[i]For one child, parents took off medication intermittantly during the school ye

Table 34

Child Response to Temporary Break in Medication[a]

Category	Hyperactive (Children=30)		Hyperactive/Convulsive (Children=6)	
	F	%	F	%
Hyperactive (more active, more restless, more figity, and more antsy)	16	53.3	1	16.7
Emotional (worse temperment, tantrums, cried more, screamed more)	3	10.0	0	0.0
Uncontrollable	9	30.0	0	0.0
Wild	2	6.7	0	0.0
Destructive	3	10.0	0	0.0
Poorer concentration	1	3.3	0	0.0
Sleep problems	3	10.0	0	0.0
Excessive talking	1	3.3	0	0.0
No change in behavior	5	16.7	2	33.3
Behavior better without medication	2	6.7	1	16.7
Careless	0	0.0	1	16.7
General: Behavior worse	1	3.3	2	33.3
Other	2	6.7	0	0.0
Total[b]	48	160.0	7	116.7

[a]Tabulated from parent interviews.

[b]Totals are inflated because parents were permitted multiple responses.

Table 35

Parent Attitude Toward Change in Dosage

Item	Hyperactive (Children=52)		Hyperactive/Convulsive (Children=14)	
	F	%	F	%
Do you think the dosage or amount of medication should be changed?				
Yes	23	44.2	5	35.7
No	29	55.8	8	57.1
Uncertain	0	0.0	1	7.1
Reason dosage should be changed:	(Children=23)		(Children=5)	
Enhance therapeutic response	9	39.1	0	0.0
Side effects	8	34.8	3	60.0
Misdiagnosed	2	8.7	0	0.0
Child developed tolerance to therapeutic response	2	8.7	1	20.0
Miscellaneous	2	8.7	0	0.0
Therapeutically improved	0	0.0	1	20.0

Table 36

Efficacy and Problems with Medication[a]

Item	Convulsive (Children=44)		Convulsive/Hyperactive (Children=14)	
	F	%	F	%
Does (did) the medication help your child?				
Yes	38	86.4	11	78.6
No	2	4.5	2	14.3
Uncertain	4	9.1	1	7.1
Why did medication help?	(Children=38)		(Children=11)	
Child no longer has seizures	18	47.4	6	54.5
Reduced number of seizures	9	23.7	2	18.2
Reduced the severity of seizures	3	7.9	0	0.0
Reduced number and severity of seizures	8	21.0	0	0.0
More alert than on other medication	1	2.6	0	0.0
Made child more aware	0	0.0	1	9.1
Improves speech and language development	0	0.0	1	9.1
Reduces child's fever	0	0.0	1	9.1
Total[b]	39	102.6	11	100.0
Have you had any problems with the medication? Did the medicine do anything you didn't want it to?				
Yes	18	40.9	4	28.6
No	26	59.1	10	71.4
Problems encountered:				
Side effects	17	94.4	3	75.0
Drug interactions	1	5.6	0	0.0
Aggrevated problem	0	0.0	1	25.0

[a]Tabulated from parent interviews.

[b]Total is inflated because parents were permitted multiple responses.

Table 37

Type of Convulsive Disorder[a]

Item	Convulsive (Children=44)		Convulsive/Hyperactive (Children=14)	
	F	%	F	%
Has your child ever had a seizure or convulsion?				
Yes	42	95.5	10	71.4
No	2	4.5	3	21.4
Uncertain	0	0.0	1	7.1
Reason for medication if not for seizures:	(Children=2)		(Children=4)	
Subclinical seizures of the grand mal type	0	0.0	1	25.0
Seizure possibility on the EEG (subclinical)	2	100.0	1	25.0
Headaches[b]	0	0.0	1	25.0
Reduce fever to prevent seizure[c]	0	0.0	1	25.0
Did the doctor give any particular name for the seizure?	(Children=42)		(Children=10)	
Yes	28	66.7	5	50.0
No	14	33.3	5	50.0
Name of seizure disorder:	(Children=28)		(Children=5)	
Grand mal	7	25.0	0	0.0
Petit mal	3	10.7	1	20.0
Psychomotor	1	3.6	0	0.0
Myoclonic	1	3.6	1	20.0
Petit mal variant	1	3.6	0	0.0
Minor motor seizures	2	7.1	0	0.0
Grand mal & petit mal	2	7.1	2	40.0
Grand mal (audiogenic) & petit mal	1	3.6	0	0.0
Grand mal & psychomotor	1	3.6	0	0.0
Grand mal, petit mal, & akinetic	1	3.6	0	0.0
Epilepsy	3	10.7	1	20.0
Idiopathic epilepsy	1	3.6	0	0.0
Status epilepsy	1	3.6	0	0.0
Convulsive disorder	1	3.6	0	0.0
Cannot remember name	2	7.1	0	0.0

[a]Tabulated from parent interviews.
[b]Doctor thought might be convulsive disorder.
[c]Child never had a seizure.

Table 39

Indications of Possible Drug Toxicity[a]

Item[b]	Convulsive (Children=44)		Convulsive/Hyperactive Children=14)	
	F	%	%	%
Do you think your child is (was) more sleepy or drowsy?				
Yes	8	18.2	0	0.0
No	35	79.5	14	100.0
Uncertain	1	2.3	0	0.0
Does (did) your child have more blank stares?				
Yes	22	50.0	7	50.0
No	21	47.7	7	50.0
Uncertain	3	2.3	0	0.0
Does (did) your child appear to be off in another world?				
Yes	14	31.8	7	50.0
No	27	61.4	7	50.0
Uncertain	3	6.8	0	0.0
Does (did) your child have poorer coordination or balance?				
Yes	32	72.7	10	71.4
No	12	27.3	4	28.6
Does (did) your child appear to be more confused?				
Yes	16	36.4	5	35.7
No	25	56.8	9	64.3
Uncertain	3	6.8	0	0.0

[a]Tabulated from parent interviews.

[b]Parents were asked to draw comparisons to other children in general.

Table 40

Premedication Behavioral Comparisons[a]

Characteristic[b]	Convulsive		Convulsive/Hyperactive	
	F	%	F	%
Drowy or sleepy	(Children=8)		(Children=0)	
Yes	1	12.5	0	0.0
No	2	25.0	0	0.0
Uncertain	5	62.5	0	0.0
Blank stares	(Children=22)		(Children=7)	
Yes	12	54.5	5	71.4
No	2	9.1	2	28.6
Uncertain	8	36.4	0	0.0
Off in another world	(Children=14)		(Children=7)	
Yes	4	28.6	5	71.4
No	4	28.6	2	28.6
Uncertain	6	42.8	0	0.0
Poorer coordination or balance	(Children=31)[c]		(Children=10)	
Yes	18	58.0	10	100.0
No	2	6.5	0	0.0
Uncertain	11	35.5	0	0.0
More confused	(Children=16)		(Children=5)	
Yes	9	56.2	3	60.0
No	1	6.3	2	40.0
Uncertain	6	37.5	0	0.0

[a]Tabulated from parent interviews. Parents were asked if their child exhibited these characteristics prior to drug treatment.

[b]Number of children for each item corresponds to affirmative responses to questions in Table 39.

[c]Data not available for one child.

Table 43

Temporary Break in Anticonvulsant Medication to Assess Therapeutic Response[a]

Item[b]	Convulsive		Convulsive/Hyperactive	
	F	%	F	%
Was your child taken off medication for a while to see if medication was still needed?	(Children=26)		(Children=7)	
Yes	3	11.5	1	14.3
No	22[c]	84.6	6	85.7
Uncertain	1[d]	3.9	0	0.0
What happened?	(Children=3)		(Children=1)	
Child had a seizure	3	100.0	0	0.0
Child fine[e]	0	0.0	1	100.0
How long ago was medication terminated? (months)	(Children=3)		(Children=1)	
3	1	33.3	0	0.0
6	1	33.3	0	0.0
21	0	0.0	1	100.0
37	1	33.3	0	0.0
Did anyone suggest break in medication?	(Children=26)		(Children=7)	
Yes	3	11.5	0	0.0
No	23	88.5	7	100.0
Who suggested it?	(Children=3)		(Children=0)	
Doctor	3	100.0	0	0.0

[a]Tabulated from parent interviews.

[b]Questions pertain to children whose parents indicated were seizure-free.

[c]Although not asked, one parent stated that medication will be terminated if child is seizure free for another year, three parents said termination had been considered but EEG was discouraging, and one parent said medication was being gradually reduced with termination the objective.

[d]Parent was uncertain about termination because child had previously been institutionalized.

[e]Mother took child off drug therapy on own initiative, but father insisted child remain on medication.

Table 44

Physician Monitoring[a]

Item	Hyperactive[b] (Children=52)		Convulsive (Convulsive=44)	
	F	%	F	%
When was the last time the doctor that prescribed the medication actually saw your child? (months)				
1 - 3	27	51.9	34	77.3
4 - 6	18	34.6	7	15.9
7 - 9	2	3.9	2	4.5
10 - 12	5	9.6	1	2.3
How often does the doctor that prescribed medication see your child? (number of times per year)	(Children=50)		(Children=44)	
1	8	16.0	3	6.8
2	10	20.0	20	45.5
3	4	8.0	3	6.8
4	12	24.0	6	13.6
5 or more	9	18.0	5	11.4
Other	7	14.0	7	15.9
How often do you talk with the doctor on the telephone? (times per year)	(Children=51)		(Children=43)	
0	2	3.9	4	9.3
1 - 2	4	7.9	2	4.6
3 - 4	3	5.9	2	4.6
5 or more	12	23.5	7	16.3
As needed (child sick, have problem)	30	58.8	26	60.5
Other	0	0.0	2	4.6
How are appointments with the doctor made?				
Doctor calls me	4	7.7	2	4.5
Parent calls doctor	35	67.3	30	68.2
Next appointment scheduled at each patient visit	13	25.0	12	27.3

[a]Tabulated from parent interviews.

[b]Smaller n's indicate missing data.

Table 45

Dosage Manipulation and Compliance[a]

Item	Hyperactive (Children=52)		Convulsive (Children=44)	
	F	%	F	%
Did the doctor say you could change the dosage when you thought your child needed more or less medication?				
Yes	19	36.5	12	27.3
No	33	63.5	32	72.7
Do (did) you give extra medication at special times when you think your child needs it?				
Yes	14	26.9	10	22.7
No	38	73.1	34	77.3
Do you ever forget to give medication to your child?				
Yes	28	53.8	22	50.0
No	24	46.2	22	50.0
How often do (did) you forget? (months)	(Children=28)		(Children=22)	
Less than once a month	3	10.7	2	9.1
1 - 2	8	28.5	4	18.2
3 - 4	7	25.0	3	13.6
5 or more	1	3.6	4	18.2
Just once	4	14.3	4	18.2
Very seldom	5	17.9	5	22.7

[a]Tabulated from parent interviews.

Table 46

Problems with Doctor and Teacher[a]

Problems	Hyperactive	Convulsive
	Frequency	Frequency
Problems with Doctor	(Children=16)	(Children=10)
(1) Rapport: uncooperative, disinterested, rude, difficult to talk to	6	5
(2) Information: inform better about disorder and the medication, more time with doctor, doctor too busy, whys of medication	9	8
(3) Medical treatment: slow to realize therapeutic needs, doesn't monitor properly, won't talk with school, poor diagnostic procedures	9	4
(4) Other: wait too long to see doctor, too expensive, get different doctor each time at treatment center	4	0
Total[b]	28	17
Problems with School	(Children=6)	(Children=4)
(1) Educational treatment: not enough staff, more time on amelioration, do not educate effectively, school system would not provide services, teacher doesn't monitor medication effectively	3	5
(2) Rapport: more communication with teacher, uncooperative	2	1
(3) Conflict in treatment objectives: school against medication, school for medication, teacher urging psychological therapy, school not understand child	4	0
Total[b]	9	6

[a]Tabulated from parent interviews.

[b]Totals are inflated because parents were permitted multiple responses.

Table 47

Questions about Medication[a]

Topics	Hyperactive (Children=25)	Convulsive (Children=14)
	Frequency	Frequency
Side effects	8	3
Therapeutic response	11	1
How drug works (effects)	8	3
Proper dosage and dosage changes	4	2
Long term effects	9	1
Harm child, be addicting, cause personality change	5	1
Termination, how long on medication	3	1
Drug interactions	1	2
More effective drug available	0	1
Change in disorder over time	0	1
Total[b]	49	16

[a]Tabulated from parent interviews.

[b]Totals are inflated because parents were permitted multiple responses.

Table 7

Comparison of Children's Characteristics Between Phase One and Phase Three

Characteristic	Phase One (Children=358)[a]		Phase Three (Children=112)	
	F	%	F	%
Sex				
Male	249	69.6	83	74.1
Female	109	30.4	29	25.9
Age in years				
3	31	8.7	12	10.7
4	90	25.1	37	33.0
5	148	41.3	40	35.7
6	72	20.1	19	17.0
7 or more	17	4.8	4	3.6
Race	(children=356)		(children=110)	
White	333	93.5	105	95.5
Black	16	4.5	4	3.6
Other	7	2.0	1	.9
On or off medication when surveyed[b]	(children=357)			
On	295	82.6	91(96)	81.3(85.7)
Off	54	15.1	21(16)	18.7(14.3)
Uncertain	8	2.3	0	0.0
Disorder[c]				
Hyperactivity	175	48.9	52(51)	46.4(45.5)
Convulsive disorder	140	39.1	44(46)	39.3(41.1)
Hyperactivity-Convulsive Disorder	28	7.8	14(11)	12.5(9.8)
Other	9	2.5	2(4)	1.8(3.6)
Unknown	6	1.7	0(0)	0.0(0.0)

[a]Smaller n's indicate missing data.

[b]Numbers in parentheses are the values when adjustments are made for drug-free periods and late terminations of drug therapy.

[c]Numbers in parentheses are the values when adjustments are made using the reason for drug therapy reported in Phase One of the survey.

Table 30

Intercorrelations Among the Five Indices of Therapeutic Improvement

(Children=52)

Varibles	1	2	3	4	5
1. Hyperactivity[a]	--	.68	.45	.36	.38
2. Attention Span		--	.61	.47	.63
3. Follow Directions			--	.37	.61
4. Peer Relations				--	.50
5. Task Completion					--

[a]Tabulated for those children indicated by their parents as hyperactive, n=47.

Table 31

Reported Side Effects of Drugs Prescribed for Hyperactivity[a]

Side Effects	Frequency
Ritalin (children=19)	
Suppressed appetite, weight loss	10
Insomnia	5
Mood changes: mean, aggressive, irritable, whiny, cried frequently	4
Nervous	2
Depression-like reaction: sedated, drowsy, lethargic, withdrawn	8
Other	4
Total[b]	33
Dexedrine (children=5)	
Suppressed appetite	2
Insomnia	2
Depression-like reaction: sedated, too quiet	2
Total	6
Tofranil (children=3)	
Hyperactive	1
Mood: mean, aggressive, irritable	1
Depression-like reaction: too quiet	1
Rebound effect	1
Total	4
Mellaril (children=2)	
Mood changes: temper tantrums	1
Hyperactive	1
Enuresis	1
Total	3
Dilantin (children=2)	
Ataxia	2

[a]Tabulated from parent interviews.

[b]Totals are inflated because some parents reported more than one side effect.

Table 38

Seizure History[a]

Item	Convulsive		Convulsive/Hyperactive	
	F	%	F	%
Does your child still have seizures or convulsions?	(children=42)		(children=10)	
Yes	16	38.1	2	20.0
No	25	59.5	7	70.0
Uncertain	1	2.4	1	10.0
How often does your child have seizures?	(children=16)		(children=2)	
Daily	5	31.2	0	0.0
Weekly	1	6.3	0	0.0
Monthly	4	25.0	0	0.0
Yearly	4	25.0	1	50.0
Other	2	12.5	1	50.0
When was the last time your child had a seizure or convulsion (months)?[b]	(children=26)		(children=8)	
1 - 3	3	11.5	2	25.0
4 - 6	5	19.2	0	0.0
7 - 9	1	3.9	1	12.5
10 - 12	3	11.5	0	0.0
13 - 24	7	26.9	2	25.0
25 - 36	5	19.2	0	0.0
37 - 48	0	0.0	2	25.0
49 - 60	2	7.7	1	12.5
Does (did) your child just have seizures or convulsions when he/she has a fever?	(children=41)[c]		(children=10)	
Yes	8	19.5	1	10.0
No	33	80.5	8	80.0
Uncertain	0	0.0	1	10.0

[a]Tabulated from parent interviews.

[b]Question pertains to only those parents that said their child was seizure-free.

[c]Data not available for one child.

Table 41

Intercorrelations Among the Five Possible Indices of Toxicity

(Children=44)

Variables	1	2	3	4	5
1. Sleepy or Drowsy	--	.24	.06	.16	.01
2. Blank Stares		--	.39	.00	.38
3. Off in Another World			---	.02	.50
4. Poorer Coordination or Balance				--	.25
5. Confused					—

Table 42

Reported Side Effects of Drugs Prescribed for Convulsive Disorders[a]

Side Effect	Frequency
Dilantin (children=13)	
Gingival hyperplasia	4
Hirsutism	1
Ataxia	4
Dilantin intoxication	3
Dysarthria	1
Drowsy	3
Other	4
Total[b]	20
Phenobarbital (children=7)	
Drowsy	2
Hyperactive	4
Mean, aggressive	1
Nervous	1
Keeps awake at night	1
Other	2
Total	11
Mysoline (children=5)	
Ataxia	3
Temper tantrums	1
Drowsy	1
Total	5
Mebaral (children=2)	
Hyperactive, mean, aggressive	1
Rash	1
Loss of appetite	1
Total	3

[a]Tabulated from parent interviews.

[b]Totals are inflated because some parents reported more than one side effect.