A COMBINED TEMPERATURE, WEIGHT, FOOD, SYMPTOM, ETC., RECORD CHART FOR PEDIATRIC WORK *

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The putting down on one sheet in a graphic and easily legible form the most important factors concerned in determining the picture and the course of a disease, as well as the therapy instituted to control it, is obviously a great advantage over the old and still quite universally practiced method of using different sheets for different data. The newer method not only saves much time, but enables one to correlate at a glance many of the observations into a picture of the whole. The idea is not original, as it was seen and used by one of us in its developed form in 1910 at the Kaiserin Augusta Victoria Haus in Charlottenburg.

The chart of this institution was ruled for thirty-one days, and was a most elaborate affair, providing not only for recording the temperature, pulse, respiration, weight, food, stools, symptoms, treatment, calories, etc., but also for various data regarding the parents, the confinement, the diagnosis and condition on admission and discharge, etc. In consequence it was awkwardly large, measuring approximately $15\frac{1}{4}$ by $20\frac{1}{2}$ inches, and in addition the proportion of the length to the width of that part of the chart recording the weight made the angle of the weight curve too acute, about 23 degrees for a daily gain of 30 gm., which, according to Heubner, as quoted by Langstein and Meyer,¹ should be $39^{\circ} 45'$ for an average daily gain of 26.6 gm. during the first three postnatal months. These dimensions also made impossible much of a rise or fall in the weight chart, except as a result of a very large gain or loss, 20 gm. gain or loss causing a movement of the curve for a vertical distance of but $\frac{7}{48}$ of an inch. Finally, the temperature, pulse and respiration charts could hardly be ruled accurately with an economic use of time, as no vertical rulings existed in the chart, except the lines separating one day from the other. On the whole, however, this chart was an improvement, and it was with the idea of applying its good points to our local hospital records that the present chart was devised.

As it was our idea to have all of the pediatric wards in which local medical school teaching was being carried out use the same chart-

* From the Babies' Dispensary and Hospital, City Hospital and Lakeside Hospital, Cleveland.

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1. Langstein and Meyer: Säuglingsernährung und Säuglingsstoffwechsel, J. F. Bergmann, 1910, p. 41.

ing and recording scheme, in order to aid in making the whole department uniform, we were bound closely to the present forms and sizes of the records of Lakeside Hospital and City Hospital, the Babies' Dispensary having adopted for its Out-Door Ward no rigid form or size of chart. Consequently, the largest electrotpe that we could use was one measuring $8\frac{5}{8}$ inches in width and $10\frac{5}{8}$ inches in length, which at Lakeside Hospital had to be printed on paper measuring $8\frac{5}{8}$ by 11 inches, while at City Hospital and at the Out-Door Ward of the Babies' Dispensary and Hospital the more spacious sheet of $9\frac{1}{2}$ by 12 inches could be used. Our present ideas regarding a more ideal size will be indicated further on.

In the chart here presented the following innovations or changes have been made:

1. The space for the recording of the weight and food has been given dimensions which make possible the formation of a weight angle of about 35 degrees with a daily gain in weight of about 30 gm.

2. As a result of this change there has been made available more space for the recording of "Treatment" and "Symptoms." In this connection it may be said that the symptoms are not described in detail, but simply given in an appellative manner. Whenever a detailed description is desirable, this must be noted in the regular history sheet.

3. The space for the individual day has been divided by three vertical lines into four spaces. This arrangement makes it possible for the nurse quickly and easily to find the correct space for the notation of the temperature degree and pulse and respiration rates, according to the hour of the day. By dividing the daily space into four parts, it is possible to make an accurate notation of the pulse, respiration, etc., every twelve hours, every six hours, or every three hours. While the space for the last is small, yet experience has shown that it is ample, owing to the ever-present oscillation in the different curves.

4. The second of the third vertical lines mentioned under 3 has again been divided into ten equal parts, so that it really is an equally divided dotted line. This has been done to give the recording nurse an accurate and rapid guide for the notation of the temperature degree, the weight figure and the pulse and respiration rates. The last two are not frequently recorded, however, so the division is usable mainly in the registering of the temperature curve and the weight curve. Although the weight curve occasionally goes down into the food space, the dotted line has not been extended down beyond the space for the registering of the temperature curve, in order sharply to differentiate the one large space from the other.

5. The space for the recording of stools has been divided into the two periods, a. m. and p. m., and it has also been increased in size, in order that the individual stools might be described if desired.

6. The electrotype has been printed in a light coffee-brown or a light gray, in order that the colors used in recording the temperature, pulse, weight, and respiration might stand out more clearly. Von Pirquet has also used a different color than black for his charts, but the one he chose, a brownish-yellow, is difficult to see with artificial light.

At the Kaiserin Augusta Victoria Haus, a color scheme was used for the charting of the different food mixtures. In one department of that institution different colored and gummed paper slips were properly pasted into the food space, while in the other department the different colors were put on the food chart by using crayons. The former scheme is possibly somewhat neater, but also more complicated, as the various food modifications require a definite color of their own. With the crayon method fewer colors are necessary, because two colors can be used together in a corresponding proportion to designate the corresponding quantity of the foods as they exist in the food mixture, and if a nurse is at all careful and sketches the colors with a light hand, a very neat and permanent record can be made with simple and inexpensive crayons that can be purchased in the market.

On the pediatric service at Lakeside Hospital the chart and the following definite color and figure scheme have been used exclusively for fifteen months consecutively, so that a practical test really has been obtained.² Only a few minor changes in recording the feedings have been made.

Food Chart.—The colors named have been used to designate the following foods:

Whole milk, ultramarine blue	Barley water, madder lake
Skimmed milk, prussian blue	Potato water, Indian red
Whey, cobalt blue	Cornstarch water, venetian red
S. M. A., violet	Keller's soup, burnt umber
Plain buttermilk, chrome green, light	Keller's soup, modified, gold ochre
Koeppé's buttermilk, olive green	Tea, yellow
Casein milk, green, medium	Breast milk, orange
Water, magenta	"Refused," black
Oatmeal water, English vermilion	

The total amount of food taken is sketched into the proper space of the food chart. If the amount taken does not correspond to the amount ordered, the difference is sketched in black above the amount taken, so that the space filled in with black designates the amount refused, and the total space occupied by both black and the food color represents the total amount ordered. As a result of this innovation of

2. Much credit and appreciation in this connection are due Miss L. O. Essery and Miss M. Francis, head nurses of Wards A and K, Lakeside Hospital.

charting the amount refused in the manner described, one obtains a beautiful picture of the appetite of the child.

If it is desirable to note the amount of water taken by the child besides the food, this is either noted in one of the free spaces below the "Additional Nourishment" space or (and this is the plan which we have adopted) it is charted in the daily "Food" space, in the color corresponding to water, just as the food is charted in the same space, except that the amount of water taken is charted from the top down and the food from the bottom up.

The actual mixtures in the daily food are indicated in direct proportion in the color scheme. So, if an infant is to have one-third milk and two thirds oatmeal water, one-third of the daily food space up to the figure representing the amount taken is colored with ultramarine blue, and two-thirds with English vermilion.

The percentage and kind of carbohydrate or salts (sodium chlorid, sodium bicarbonate) added to plain water or to the different food mixtures are indicated by writing with a hard black crayon, in the upper part of the food color column, the following letters and figures:

L = Lactose	SC = sodium chlorid
S = sucrose	SB = sodium bicarbonate
D = dextrose	1 = 1 per cent. of total mixture
Lv = levulose	1½ = 1.5 per cent. of total mixture
DM = dextri-maltose	2 = 2 per cent. of total mixture
M = Mellin's food	2½ = 2.5 per cent. of total mixture
MS = malt soup	3 = 3 per cent. of total mixture, etc.

So the appearance of "3 S" just below the top of a 600 c.c. color column, representing one-third milk and two-thirds oatmeal water, would indicate that 18 gm. of sucrose had been added to the total to make a 3 per cent. addition of sucrose to the 600 c.c. mixture of one-third milk and two-thirds oatmeal water.

The number of feedings in twenty-four hours is noted just above the bottom of the color column for a given food mixture by writing in black with a crayon, Roman figures corresponding to the number of feedings ordered. In the foregoing example a "VI" in black at the bottom of the 600 c.c. column—one-third milk and two-thirds oatmeal water—would mean that the child was to receive 6×100 c.c. in twenty-four hours.

If a change in the food should be ordered, and so during one day a child receive two kinds of foods, the first mixture given is sketched at the bottom of the column and the second directly above it.

Illustrative examples of most of the points just made can be found in the accompanying charts.

Additional Nourishment Notes.—The additional nourishment column is used for the recording of vegetables, cereals, zwieback, etc.

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Fig. 1.—Example of authors' chart in use. The black line marked "T" is the temperature curve; the line marked "W" in the original chart is in red ink and is the weight curve. The portion shaded with diagonal lines represents Synthetic Milk Adapted and in the original chart in practical use is colored violet. The portion shaded with vertical lines represents water and in the chart in practical use is colored magenta. A complete description of the color scheme and other data recorded on the charts will be found in the text. About two-thirds actual size.

Weight, Temperature, Pulse and Respiration Chart.—The weight curve is sketched in red ink (W); the temperature curve in black ink (T); the pulse curve in purple ink; and the respiration curve in green ink.

Symptoms and Treatment Notes.—The treatment notes are written in red ink on the chart by the nurse, and the symptoms in black ink by the intern or clinical clerk. Two colors are used clearly to separate these contiguous notes, and the black has been used for the recording of the symptoms simply because it is desired to make these notations during the ward visit or immediately after, and, under these circumstances, black ink is at all times available, in the form of the ordinary black ink fountain pen, for every intern and clinical clerk.

Stool Chart.—The color scheme has also been utilized, together with the sign scheme, in the recording of stools.

The following crayon colors are used to indicate the following stool colors:

<i>Crayon</i>	<i>Stool</i>
Chrome yellow, medium	Lemon yellow
Gold ochre	Yellow-brown
Orange	Orange-carrot yellow
Madder lake	Beet red
Chrome green, light	Yellow-green
Chrome green, dark	Green
Olive green	Gray-slate
Burnt umber	Brown—Keller's, older children, hemorrhage
Black	Bismuth—old blood

| = formed soft stool.

\ = semi-solid, soft stool of salve-like consistency.

\\ = a thin stool whose consistency is between a watery stool and a semi-solid, salve-like stool. In many children this is not abnormal.

— = watery stool and abnormal, as far as consistency is concerned.

~ = squirting, watery stool seen only in marked diarrhea.

' = mucus, slight in amount.

" = mucus, medium in amount.

''' = mucus, marked in amount.

c = choppy, stringy stool, usually greenish-yellow and with mucus = dyspeptic stool.

C = casein curds.

s = soft, putty-like, or partly sandy, semi-solid, gray, yellowish-gray, or greenish-gray fatty soap stool.

S = hard, dry, pale gray, very light yellow or green-gray fatty soap stool.

F = soft, thin, shiny fatty stool, usually yellowish.

b = blood streaked on outside of stool, usually bright red and mechanical in origin.

B = blood, mixed well with stool and usually with pus, of a brown-red tomato-sauce color, seen mainly in enteritis follicularis.

H = blood, bright red or dark brown or black, when very large in amount. and due to hemorrhage, as in intussusception, typhoid or hemorrhagic diseases.

P = pus, usually mixed with blood, in enteritis follicularis.

Metric System.—It will be noticed that only the metric system has been used in this chart. This is in conformity with the plan which one of us inaugurated at the Babies' Dispensary during 1906, since which time all of the weight amounts, temperature degrees, and food amounts have been determined according to the metric system, not only for the physicians and nurses, but for the public as well, and it has been continued for added reasons: (1) in practically all scientific work of the various civilized countries the metric system is used, and (2) we believe that if it is more generally used in practical institutions like hospitals, dispensaries, etc., it will help toward its adoption by the public at large for their own daily personal use.

Pasting of Chart Sheets.—Even with the smallest sheet, $8\frac{5}{8}$ by 11, it is possible, if so desired, to make one continuous chart out of the individual seventeen-day chart sheets by simply using a photographic trimming knife and library paste.

Ideal Chart Size.—Earlier in the article it was indicated that the form of the chart as presented today was determined by local conditions, and that ideally we should prefer a somewhat different form. From the experience which one of us has had at Lakeside Hospital during a period of fifteen months, this ideal electrotpe size should at present measure $9\frac{23}{24}$ inches wide by $13\frac{14}{15}$ inches long. The increase in width would add three days to the chart, making a total of twenty days. The increase in length of the present chart is applied as follows:

1. The "Temperature" space is increased to $6\frac{3}{4}$ inches.
2. The "Food" space is increased to $4\frac{1}{20}$ inches.

These alterations will change the angle of the weight curve for a daily gain of 25 gm. to $37^{\circ} 21'$, which would correspond with Heubner's figures of $39^{\circ} 45'$ for an average daily gain of 26.6 gm. This change also gives still more space in the "Symptom" and "Treatment" columns for the respective notations.

3. The "Additional Nourishment" space is increased to $\frac{3}{48}$ of an inch.

4. The blank spaces for extra notes under the "Additional Nourishment" space are increased in number from three to four.

This new form could be printed on paper measuring 10 by $14\frac{3}{8}$ inches, corresponding with $8\frac{5}{8}$ by 11 in the present chart, or better on a larger sheet measuring $10\frac{7}{8}$ by $15\frac{3}{8}$ inches, corresponding with $9\frac{1}{2}$ by 12 in the present chart.