

## OBSTETRIC CHRONOCHART - a new simple way of finding 'WEEK' of amenorrhoea.

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### SUMMARY

Subtract the week No. of date of LMP - from the week No. of the date you want the week of amenorrhoea for - the result will be the 'week' of amenorrhoea on that specific date.

The week Nos. referred here has to be just read off (already printed) from a specially designed chart called - Obstetric Chronochart which is nothing but a 'normal' calendar - divided into weeks and serially numbered.

### INTRODUCTION

Though 'week of amenorrhoea' is the primary data required at every step in managing a pregnancy, it is surprising that to date, there is no formula available for instantly and precisely calculating it. The only method available for the purpose is a small disc shaped implement called 'pocket obstetric calculator' or the 'disc', which, though a fairly easy method, has not become popular in India (only 11 percent of Indian Obstetrician use it - Debdas, 1989) - because of the drawback that for each and every calculation by this implement certain amount of obligatory handling (i.e. rotation and setting of discs) is involved which is perhaps not acceptable to many.

In this communication, the author presents

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a new simple table top method of finding week of amenorrhoea with the help of a specially designed (by the author) chart called 'Obstetric Chronochart'. The method involves just one simple, (often mental), subtraction.

### DESCRIPTION OF OBSTETRIC CHRONOCHART

(Please follow it on the chart as you read)

Obstetric chronochart (Debdas, 1989) is nothing but a 'normal' 2 years calendar divided into 104 weeks each of which has been serially numbered, referred as - WEEK No. Hence each week No. covers seven dates immediately following it.

It may be observed on the chart that - (for mathematical reason), *only four* out of seven dates of a week is printed on the chart *per week No.* in alternate fashion as 2,4,6,8 or 1,3,5,7, etc., and that - in some weeks the fourth date of the

week has been printed by the side if the third date rather than below it (see week no. 2, 16, 29 etc. for clarification). The relevance of this 'four date system' is - from any of these four positions (dates of any week to any of the corresponding (respective) four positions (dates) of any other week constitute *completed week* e.g. from first date of one week to first date of any other week constitute completed week; similarly, second date-to-second date, third date-to-third, fourth date-to-fourth date and week No. to week No. also constitute completed week.

In this chart, two year's calendar have been provided for the purpose of spilling over for cases where LMP happens to be towards the end of the year because, naturally, in these cases the pregnancy and the expected date of delivery will extend into next year.

This chart is a perpetual calendar - *valid for ever*. Therefore there is no need to get a new chart every year.

Please note that none of the above facts need to be remembered for the use of the chart. They have been given just for clarification.

(Week No. 51, 90 and 104 have one extra day each but these are of no consequence).

#### THE ACTUAL METHOD OF FINDING WEEK OF AMENORRHOEA FROM THE CHART

- a) Simply read off the following from the chart.
  - Week No. of date of LMP.
  - Week No. of the 'date in question'.
- b) Subtract former from the latter - the result will be the week of amenorrhoea on that specific date.

**Example:** Suppose a patient's LMP was on 22nd of April and she has come for her antenatal checkup on 9th September - how many weeks will she be on this visit date?

Find week No. of 22nd of April (which happens to be 15 - see chart); now, find the week No. of 9th of September (Which happens to be 35 - see chart). Now, Subtract 15 from 35 and the result will be the week of amenorrhoea on that specific date. Since the result in this case is 20 (15 minus 35 being 20) - the week of amenorrhoea, in this case will be 20 weeks.

#### NOTE:

1. The 'date in question means the date for which you are wanting to find precise week of amenorrhoea e.g. dates of antenatal visit, scan-date, date for termination of pregnancy, date for amniocentesis etc.
2. For locating the date of LMP - always use first year's calendar. Naturally, all other dates i.e. all the dates in question will come after that.
3. Because the chart prints only alternate dates (like 3.5.7 etc.), sometimes the exact date that one may be looking for may not be found on the chart (but, of course, one date before and one date after will always be found). But this does not affect the calculation of week of amenorrhoea because it is based on week No. and not on date. In any case, this can only give error of one day which hardly matters.

#### DISCUSSION

The first criticism that the chronochart has to face is from the Obstetricians who use the 'mental method' (i.e. those who do the calculations completely mentally) and they constitute, as found by Debdas (1989), about 85% of the Obstetricians of India. It may be surprising but this apparently simple method, on algorithmic representation, would appear to consist of as many as six steps including two substeps as detailed below. Let us, for the purpose of explaining use the same example (problem) as cited earlier for the use of chronochart for easy comparison between two methods.

The problem - patient's LMP was on 22nd April and she has come for her antenatal checkup on 9th September - how to find how many weeks is she on this visit date by this 'mental method' -

**Step 1:** count the time gap in month - date to date - starting from 22nd April on your finger like this: from 22nd April - to 22nd May is one month, - 22nd June it is two months, to 22nd July it is three months, - to 22nd August it is four months. One has to stop on 22nd August here because going to 22nd September would mean going far past the 'date in question' which is 9th of September.

**Step 2:** Multiply the month figure as derived above (4 months) by 4 to convert it into week - assuming that a month is roughly constituted of four weeks. Hence, upto 22nd of August the duration of amenorrhoea in this case would be -  $4 \text{ month} \times 4 = 16 \text{ weeks}$ .

**Step 3:** Now, find out the remaining days between 22nd August and 9th of September by following these two substeps -

- a) 31 days of August - minus 22nd (22 days) of August = 9 days.
- b) Add this 9 days to the 9 days of September i.e.  $9+9 = 18 \text{ days}$ .

**Step 4:** Now, divide the above figure (18 days) by 7 to convert it into week which works out as -  $18 \div 7 = 2 \text{ weeks } 4 \text{ days}$  (i.e. 2 weeks +).

**Step 5:** Lastly, add this week result (2 weeks +) to the weeks result obtained by converting months into week as derived by the step 2 exercise above (16 weeks).

So, finally 'week' of amenorrhoea in this case stands as  $16+2=18 \text{ weeks}$  by this mental method.

But, unfortunately, though most Obstetrician who use this method do not realise that, this result is wrong by, as much as, 2 weeks because the actual period of amenorrhoea here is 20 weeks (precisely) - a result which tallies exactly

with the chronochart result (See under example above).

Now, the intricacies and complications of mental mechanism explained and the gross error that this method produces exposed - will it be proper to use this method? Certainly not because this will amount to practice of unscientific and substandard medicine.

As regard the 'disc calculator method' of finding week of amenorrhoea, on critical analysis, it was found that this method was very comparable to the method proposed here i.e. the use of obstetric chronochart both being equally accurate for the job.

Now, accuracy granted, let us assess the comparative advantage and disadvantage of the disc method vis-a-vis use of chronochart. So far as advantage is concerned the two major plus points that the disc method has over the chronochart is the speed with which it gives result (20-25 seconds faster than chronochart), and that it does not involve doing any calculation on the part of the user. As regards disadvantage, the disc also has two small but significant disadvantages namely, firstly, it needs obligatory manipulation i.e. setting and re-setting (of discs) for each and every use (as already mentioned) and secondly, it entails on the part of the user facing a new visual situation everytime. The latter is due to the rotating, hence ever-changing, calendar system of the disc and also to the peculiar disposition of its dates - all 365 being set in one long row and in circular form which is impossible to memorise or master.

It is on these two points that the chronochart has an edge over the disc education - the chronochart being a 'normal' usual everyday calendar with all its dates having their (permanently) fixed location and also that this implement does not require any manipulation or adjustment to derive result (week of amenorrhoea). The chronochart, in fact, can be placed under the glass of Obstetricians desk or can be hung (the

DEBDAS' OBSTETRIC CHRONOCHART

FIRST YEAR CALENDER				FIRST YEAR CALENDER				
Wks. Rs.				Wks. Rs.				
0	1 JAN	1 APR	39 1 JUL	39 1 OCT	52 1 JAN	65 1 APR	78 1 JUL	91 1 OCT
3		13 2	26 2	3	2	3	3	2
5		4	4	5	4	5	5	4
7		6 8	6 8	7	6	7	7	6
1	8	14 9	27 9	40 8	53 7	66 8	79 8	92 7
10		11	11	10	9	10	10	9
12	14	13 15	13 15	12 14	11 13	12 14	12 14	11 13
2	15	15 16	28 16	41 15	54 14	67 15	80 15	93 14
17		18	18	17	16	17	17	16
19	21	20 22	20 22	19 21	18 20	19 21	19 21	18 20
3	22	16 23	29 23	42 22	55 21	68 22	81 22	94 21
24		25	25	24	23	24	24	23
26	28	27 29	27 29	26 28	25 27	26 28	26 28	25 27
4	29	17 30	30 30	43 29	56 28	69 29	82 29	95 28
31			31	31	30	31	30	
2 FEB	2AUG	1 AUG	2NOV	1 FEB	1MAY	2 AUG	1NOV	
44	4 6	3 5	4	3	3 5	4	3	
5	18 7	31 6	44 5	57 4	70 6	83 5	96 4	
7	9	8	7	6	8	7	6	
9	11	10 12	9 11	8 10	10 12	9 11	8 10	
6	12	13	12	11	13	12	11	
14	14	15	14	13	15	14	13	
16	18	17 19	16 18	15 17	17 19	16 18	15 17	
7	19	20 21	46 19	59 18	72 20	85 19	98 18	
21		22	21	20	22	21	20	
23	25	24 26	23 25	22 24	24 26	23 25	22 24	
8	26	27	47 26	60 25	73 27	86 26	99 25	
28	30	29	28	27	29	28	27	
		31	30		31	30	29	
2 MAR	1 JUN	2 SEP	2 DEC	1 MAR	2 JUN	1 SEP	1 DEC	
4	3	35 3	48 3	3	74 3	87 3	100 2	
9	22 4	5	5	61 4	5	4	4	
7	6	7	7	6	7	6	6	
9	11	9	9	8 10	9	8	8	
10	12	36 10	49 10	62 11	75 10	88 9	101 9	
14	13	12	12	13	12	11	11	
16	18	14 16	14 16	15 17	14 16	13 15	13 15	
11	19	17	50 17	63 18	76 17	89 16	102 16	
21	20	19	19	20	19	18	18	
23	25	21 23	21 23	22 24	21 23	20 22	20 22	
12	26	38 24	51 24	64 25	77 24	90 23	103 23	
28	27	26	26	27	26	25	25	
30	29	28	28	29	28	27	27 29	
		30	30 31	31	30	29 30	104 30 31	

enlarged version) on the wall of the clinic just like a calendar for use by many doctors at the same time from a distance.

Besides above, there are two other specific advantages of chronochart per se namely - a) this being a never changing calendar, over period of its use, the picture of the whole calendar gradually gets imprinted on the mind of the user making the date finding almost spontaneous, and b) occurrence of 'number table effect' - because the calculations involved in the use of chronochart are necessarily limited within the figure 40 ( the duration of full term pregnancy being 40 weeks) and because these calculation keep recurring - even these (e.g. 49 minus 19=30 weeks) get imprinted onto user's memory just as the number tables do (like - 9 times 8 is 72)

which makes the use of chronochart even easier and faster.

So, as it would appear from the above discussion - the chronochart and the disc calculator, through they use very different principal, are more or less of equal merit.

**CONCLUSION**

Obstetric chronochart is a simple, useful Indian innovation for prompt and precise calculation of 'week' of amenorrhoea. It is an at -par alternative to the disc calculator.

**REFERENCES**

*Debdas, A K : Transaction of annual conference of Jamshedpur Obstetric and Gynaecology Society, Steel City press, Jamshedpur 28 January, 1989.*

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