

# Using Diaries, Calendars and Technology to Improve Headache Care

From optimizing the benefits of paper calendars to embracing new electronic technologies, neurologists can gather crucial data to improve patient care.

By Brian Loftus, MD

**L**ike many neurologists, I spend the majority of my day treating patients with headaches. Most patients fall into one of three groups: A small number of patients who have episodic migraines and only need acute care, along with a second group comprised of patients who are doing very well on stable preventatives and who require only minimal adjustments of their medications. The third group of patients have complicated, chronic daily headaches. They are currently taking preventatives but have failed prior preventatives and have only partial response to acute therapy.

When the majority of patient encounters are for follow-up headache care, a successful practice model is necessary to handle these patients in a time efficient manner while also optimizing their headache care. In an idyllic world, the patient would come to each visit prepared to tell of the number of headaches they have had prior to the visit, the amount of disability they have with each headache, medication(s) taken, and medication response. This data allows us to evaluate their current therapy to determine if it is adequate, and we can quickly decide what changes need to be made. By looking at the number of medication doses



taken, it can be determined if the patient has the potential for rebound headache. Finally, tracking the cumulative disability over time can determine

Sample Paper Diary																																
Name _____																																
Month _____																																
Year _____																																
Migraine Scale: 1 Mild; 2 Moderate; 3 Severe																																
Medicine #1 _____; #2 _____; #3 _____																																
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Max Severity																																
Medicine #1																																
Medicine #2																																
Medicine #3																																
Notes																																

the quality of my overall care for the patient's headaches.

**Paper Diaries**

When I was in training, many of my attendings frowned upon migraine diaries. They told of obsessive-compulsive patients who would write page upon page of notes for each headache. This is clearly not very helpful and definitely not time efficient and I too found this out by personal experience once in practice.

Because a high percentage of my time is spent with patients who have headaches, I have worked hard over the years to find a format for a diary that would help optimize patient care while increasing my own practice efficiency. First, by referring to them as calendars and not diaries, the patients understood that I was looking for a limited amount of information. Their tendency to add on a lot of extraneous information was much less. Furthermore, giving patients a simplified paper calendar (See sample headache calendar, above) was a relatively easy way for them to gather most of the necessary data.

The calendar provides room for indicating on any given day whether they have a headache, the severity of the headache, medication taken, and limited notes. Relatively quickly one can score the number of headaches per month, number of severe headaches per month, and the amount of medication taken.

All my patients who take a preventative are strongly urged to keep a headache calendar. At follow up, I estimate that about two out of three patients claim they have kept a calendar. Unfortunately, a lot of patients leave their calendars at home or at the office: Only about one out of three patients actually brings his/her calendar to the follow-up visit. In addition, patients say their calendar is inaccurate because they keep the calendar at home and forget to write down headaches that occurred at work or vice-versa. This is more a problem for males, who do not carry a purse, than for females. When patients do bring their paper calendars to their appointments, it is quickly clear how much better the visit progresses and how much easier it is to make treatment decisions.

## Headache Calendars

While having written headache calendars is quite helpful, they are still lacking in three major areas. First, they have to be scored. Only a few patients are able to understand how they are scored and complete this because of how time-consuming it can be. Second, paper calendars do not keep adequate track of disability. After all, it is not the severity of the headache but how long the patient is disabled that matters. And as previously mentioned, many patients either do not fill them out accurately or forget to bring them to their appointments.

### Going Electronic

An improvement to the paper calendar is the electronic calendar. Placing an electronic headache calendar or diary on a cell phone or similar device that the patient already carries solves the problems associated with paper headache calendars. For this reason I developed iHeadache™, an application for the Apple iPhone and iPod Touch. A Blackberry version is also under development and will be available before the end of 2009.

iHeadache gathers headache symptoms, severity, disability, and medication usage in real-time. (See screen shots of headache, disability, and symptoms pages, at right.) The symptoms, medication(s) taken, and length of headache are analyzed to determine if an individual headache meets IHS criteria for migraine, probable migraine, or tension headache.

The application's most valu-

able feature is its reporting capability. iHeadache provides reports that detail the number of headaches by type, medication usage, MIDAS scores, and the amount of total and partial disability. The reports can be broken into time periods such as 28 days, 30 days, and months to make it easier to look at the effectiveness of different preventative treatment plans. (See screen shot of reports, next page.)

With these reports, physicians can quickly determine the success of preventative and acute therapies, possibility of rebound headaches and the degree of disability. They can even determine patients who meet criteria for I.H.S. chronic migraine versus IHS chronic daily headache. Patients rarely forget their smart phones at home so the data is readily available at their office visit.

As an example, I include my very first patient who returned with two months of data. On the attached report you can see how her migraine count improved after starting her on a new preventative at the previous visit. In addition, although she describes her acute medication as “working fine,” I can see that her acute treatment regimen is lacking and she is still having disability.



The biggest negative to an electronic headache calendar is accessibility. Market data suggest about 20 percent of adults in the US currently own an iPhone or iPod Touch. In my experience, a significant number of patients are willing to purchase an iPod Touch to assist with their care. The cost for a new iPod Touch is about \$200, and there are no on-going service fees. An Internet connection on the device is only needed to install iHeadache or to email reports. Once iHeadache is available on the Blackberry, another 15 percent of patients will have access to the program.

Assuming headache physicians support iHeadache and it sells sufficient copies, the future is revolutionary. iHeadache 2.0™ will work with iHeadache Web™ to bring new reporting capabilities that are otherwise not possible. With iHeadache Web™, physicians will be able to track their patients over time to document the patient's response to their care. Physicians will also be able to sort their patients by disability and headache frequency then determine what the average patient looks like under their care after 90 days. They will also be able to compare their patients to those of their peers and they will even be able to

look at their practice style and see how it compares to those of other physicians. ■

Visit [www.iHeadacheApp.com](http://www.iHeadacheApp.com) to read more about iHeadache, request patient brochures for your office, and view documentation or video tutorials. The cost for the patient to download iHeadache from the Apple App Store is \$9.99. The price for the Blackberry version of iHeadache has not been determined.

Brian D. Loftus, MD is a neurologist in private practice at Bellaire Neurology in Bellaire, Texas (Houston, Texas). He can be reached at [BLoftus@BellaireNeurology.com](mailto:BLoftus@BellaireNeurology.com).

### Sample Patient Report

Patient name : (name removed for HIPPA)  
 Report generated on : 09/16/09 @ 12:09 PM  
 Start date : 07/07/09  
 Stop date : 09/16/09

For the 28 day span from 08/12/09 to 09/08/09, 2 headaches were reported.

Headache Type  
 1 Migraines, 0 Probable Migraines  
 1 Tension Headaches, 0 Unclassified Headaches  
 Some headaches missed duration

Medications  
 2 doses of Zomig® (zolmitriptan) 2.5 mg

Disability  
 2.75 hours of total disability  
 3.50 hours of partial disability

MIDAS disability score as of 09/08/09 @ 08:42 PM is 22 (estimated)

For the 28 day span from 07/15/09 to 08/11/09, 12 headaches were reported.

Headache Type  
 7 Migraines, 5 Probable Migraines  
 0 Tension Headaches, 0 Unclassified Headaches  
 Some headaches missed duration

Medications  
 14 doses of Zomig® (zolmitriptan) 2.5 mg

Disability  
 13.17 hours of total disability  
 18.08 hours of partial disability

MIDAS disability score as of 09/08/09 @ 08:42 PM is 30 (estimated)



Left: iHeadache "pages" for: Headache Quality, Disability, Symptoms, Reports, and Log. Above: Patient 28-day report.