

## *Updated Software for Use with a Peak Flow Meter to Evaluate Patients Whose Asthma Symptoms are Worse at Work*

Peak flow monitoring remains the most cost effective way to evaluate a patient who gives a history that their asthma is worse at work (1).

This newsletter describes updated software that makes it easier to review the multiple readings recorded by the patient and interpret whether the results are consistent with work-related asthma.

Unlike the typical recommendation of using a peak flow meter two to three times a day to assist in management of an asthma patient, peak flow monitoring performed as part of the diagnostic workup of work-related asthma is recommended every two hours while the patient is awake to maximize the sensitivity of the testing (1). Although, one study found that peak flow testing done at least four times a day had equivalent sensitivity to testing every two hours (2). Testing is recommended over a four week period, two weeks at work and two consecutive weeks off work to maximize sensitivity (1). Patients will typically need a note from their provider that the patient will be off work for two weeks for medical testing. For many patients this will not be possible, but at least one week away from work is recommended (1).

If the patient changes their work shift or the dose or type of asthma medication they are taking, or they develop a respiratory infection during the three to four week testing period, interpretation of the peak flow results becomes more complicated and it may be necessary to repeat the peak flow testing.

Clearly, peak flow meters have limitations. Peak flow testing is effort dependent, requires a cooperative patient and the results can be falsified. Table 1 summarizes changes that may suggest the patient has falsified their peak flow results. Portable flow-sensing spirometers that electronically record the results as well as have flow diagrams to evaluate effort address the limitations of peak flow meters but these devices are not as readily available, are more expensive, require the device to be returned and require additional training of the patient.

The sensitivity of peak flow testing in comparison to specific inhalation challenge testing is 64% (95% CI 43-80%) and the specificity is 77% (95% CI 67-85%) (3). Higher sensitivity and specificity for peak flow has been reported in comparison to expert opinion, 75% and 94% (4).

### **Table 1 Changes Suggesting the Patient May Have Falsified the Record**

- Absence of a morning dip in peak flow.
- Presence of a long series of identical readings.
- Use of the same writing instrument to record measurements throughout the whole 3-4 week period.
- Presence of the same starting time of measurement on work days and days off.
- Absence of signs of wear and tear on the paper used to record results. The paper should have been carried around for 3-4 weeks.

## References

1. Tarlo SM et al. Diagnosis and management of work-related asthma. ACCP Consensus Statement. Chest 2008; 134:1S-41S.
2. Malo JL, Cote J, Cartier A, et al. How many times per day should peak expiratory flow rates be assessed when investigating occupational asthma? Thorax 1993; 48:1211–1217.
3. Beach J, Rowe B, Blitz S, et al. Diagnosis and management of work-related asthma. Summary evidence report/technology assessment. Rockville, MD: Agency for Healthcare Research and Quality, Department of Health and Human Services, October 2005; Publication No. 06-E003–1.
4. Fishwick D, Bradshaw L, Henson M, et al. Occupational asthma: an assessment of diagnostic agreement between physicians. Occup Environ Med 2007; 64:185–190.

## Creating Peak Flow Charts Using OASYS II (date released – April 2012)

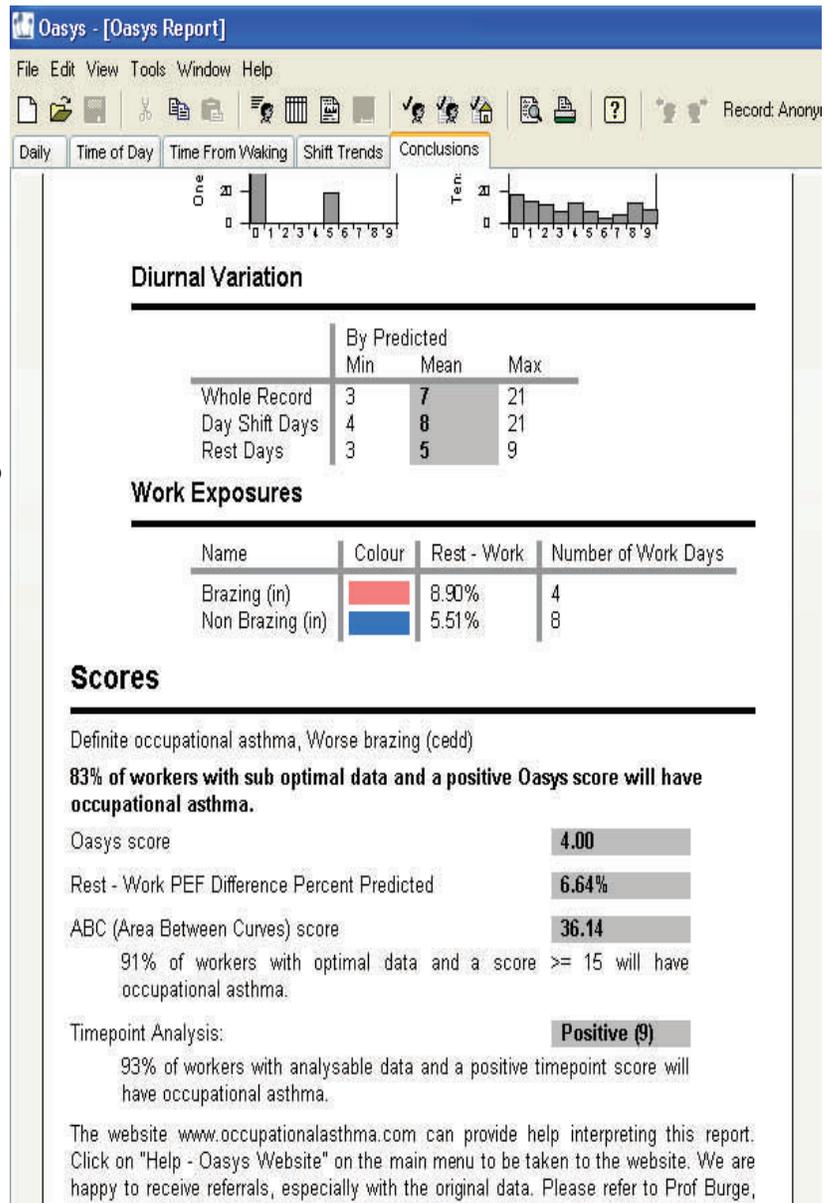
In April 2012, an updated version of software to input and interpret peak expiratory flow (PEF) meter results was released. Peak expiratory flow meter results are entered manually or uploaded from a spirometer, and the results are graphed and analyzed. An “OASYS work effect index” is generated, ranging from a value of 1 to 4. An index of 2.51 or greater suggests a work-related deterioration in PEF.

OASYS II continues to be available to health professionals free of charge.

Health professionals can download the new program directly from the creator’s web site at: [http://www.occupationalasthma.com/occupational\\_asthma\\_pageview.aspx?id=4443](http://www.occupationalasthma.com/occupational_asthma_pageview.aspx?id=4443) The website also contains clear and detailed documentation on the program.

At minimum, the following information must be available:

- Patient identifier
- Dates of readings
- Peak flow results
- Time of each reading
- Daily wake and bedtimes
- Start and stop work times



A PEF recording sheet is available on the website to ensure the patient collects the needed information.

We recommend you read through all sections of the web site to familiarize yourself with the specifications of the program before you begin to enter patient data. There are many more details and options available with the program than are listed in the steps below.

**STEP 1 REGISTER WITH THE WEB SITE**

You must register with the web site in order to use the software. NOTE: Each time you use the software on your computer, you must log in with your email address and a password that you create when you first register.

[http://www.occupationalasthma.com/occupational\\_asthma\\_pageview.aspx?id=4443](http://www.occupationalasthma.com/occupational_asthma_pageview.aspx?id=4443)

**STEP 2 INSTALL THE OASYS II PROGRAM**

Choose which set up program you wish to install: hand-entry, the Clement Clarke Mini Wright Digital meter, or the Vitalograph Asma-1. Follow installation instructions.

**STEP 3 ENTER PATIENT DATA** – refer to the Data Sheet section

The following steps will detail how to input data by hand. Open the program—enter your email address and password. Select FILE-New Record and follow instructions for entering patient info, and type of peak flow meter used. There is a lot of additional optional information. The Workplace and Readings sections (predicted value) are optional. Click FINISH once all available baseline information is entered for the patient.

**STEP 4 ENTER PEAK FLOW VALUES**

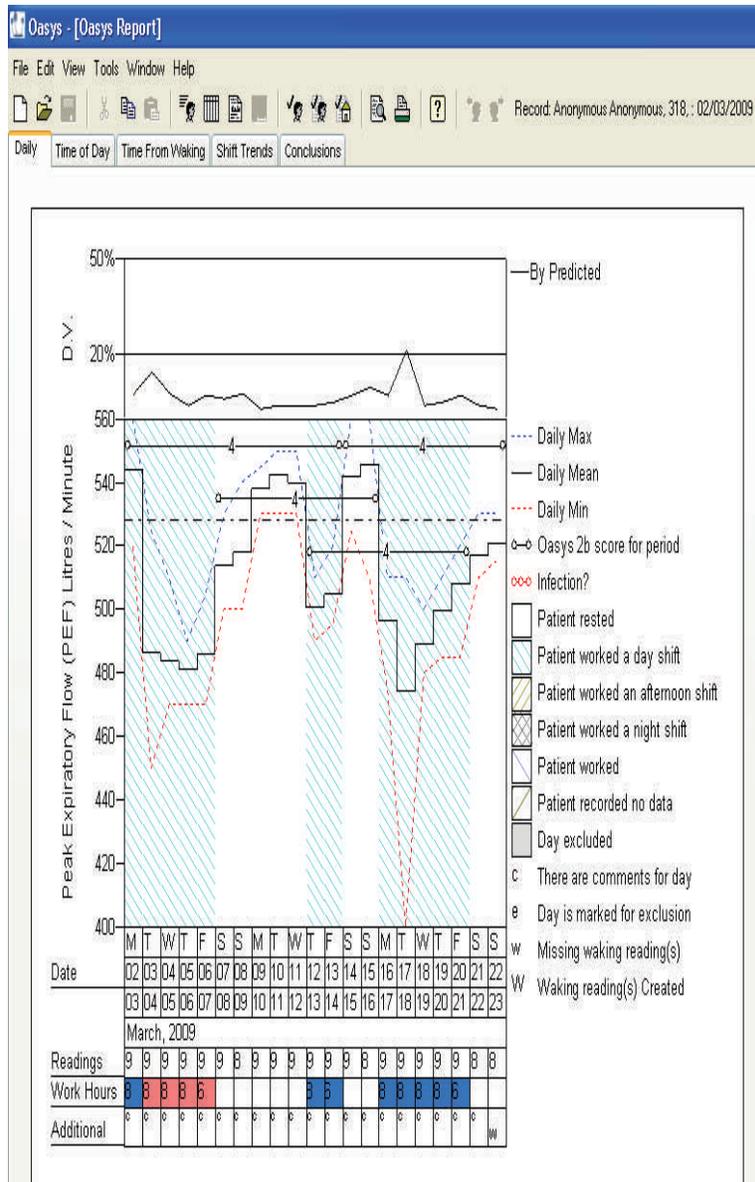
Use the number pad on the keyboard to enter the peak flow values. There is an option at the bottom of the page “x 10” which multiplies the values entered by 10. So, for example, if you enter “52” the peak flow value will show up as “520” on the Data Sheet. To record waking up, starting work and ending work, and going to bed, press the “enter” key on the number pad. The first time you press “enter” at a certain time on the Data Sheet, the program will attach “waking up” to that time period. The next time after that when you select “enter” the program will attach “starting work” to that entry. If the individual did not work that day, simply hit the “enter” button two more times so the “going to bed” selection is attached to that time period. Each time you press the “enter” button the program cycles through those 4 actions, always in the same order – wake, work, end work, and bed.

**STEP 5 SAVE THE DATA**

Once all data had been entered, select the “save” button at the top of the page.

**STEP 6 GRAPH THE RESULTS** Select “View” and then “OASYS Report” from the top of the page. The report will graph the result and analyze the data. The Conclusions section of the report includes the OASYS score. An OASYS score of 2.51 or greater suggests a work-related deterioration in PEF.

These are the most basic steps and information about the OASYS program. The OASYS web site contains more details on adding data to an existing patient’s record, editing, and how to interpret various graphs. We recommend a careful reading of the web site documentation prior to generating a peak expiratory flow report using OASYS.



Please call Mary Jo Reilly at 1 800 446-7805 if you need assistance with the OASYS II software or Kenneth Rosenman MD for questions about diagnosis or management of individual patients.

\*Project  
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In this issue: v23n3: Updated Software for Use with a Peak Flow Meter to Evaluate Patients  
Whose Asthma Symptoms are Worse at Work

\*PS Remember to report all cases of occupational disease!

Printed on recycled paper.

The Project SENSOR News is published quarterly by Michigan State University-College of Human Medicine with funding from the National Institute for Occupational Safety and Health and is available at no cost. Suggestions and comments are welcome.

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