25 June 2009

In April 2009, the Guilford County Department of Public Health received a request to evaluate reports that the staff and students of Oak Ridge Elementary School (ORES) had been exposed to and had become ill from mold growth within the building. Since the request, Public Health staff has:

1. Inspected the building
2. Interviewed teachers and staff
3. Attended the open forum at the ORES
4. Reviewed environmental reports
5. Met with School officials and administration
6. Reviewed the medical literature pertaining to mold and human health
7. Acquired information from representatives of the Centers for Disease Control and Prevention
8. Acquired information from two EPA funded physicians expert on mold and human health
9. Acquired information from the North Carolina Department of Public Health
10. Constructed, administered, collated and interpreted a health survey of staff and parents/guardians of students at ORES

The following statements represent our current understanding of the origin of the ORES concerns and recommendations based on the available science and medical knowledge. As with any diagnosis, our opinions are subject to change as inspections proceed at the school over the summer.

Oak Ridge Elementary School is an amalgam of a renovated building and adjacent new construction. As many such large patchwork facilities experience, there were leaks in the roofline that allowed water to enter at various points. The indoor dampness elicited mold growth that ultimately became visible to parents and staff. Cultures were taken of the area in 2007 and yielded *Aspergillus* and *Penicillium*. The testing procedure is not standardized and there are no accepted guidelines to allow interpretation of results.)

The Guilford County School Administration has hired and listened to numerous experts on indoor air quality. They have patched rooflines, diverted drainage channels, replaced drywall, and put down tile in place of carpet. The areas of the building which have dampness and mold have either been remediated or are in the process of remediation.

The appropriate response to finding visible mold in any building is to find and to repair the leak, which allowed the moisture to enter, and to clean or to replace the surfaces where the mildew has grown. Further additional efforts are not medically indicated at this time. The detection of antibodies to molds in any person is expected and a sign of an intact and normal immune system.

The purpose of our recent survey was to catalog the symptoms of students and staff. We asked in the survey whether during the last two years individuals had had dry eyes, rashes, allergic symptoms, headaches and the like. Approximately 800 surveys were distributed. Half of the surveys returned within the week's deadline: a respectable response. A summary of the responses showed that the driving symptoms were headache and fatigue that occurred within the school and that resolved when fresh air was obtained by opening windows and doors to the classrooms, by going outside or by going home (see Appendices 1 and 2). Nosebleeds were also common. Other symptoms were tabulated, but their frequency was not as elevated; nor was there a specific pattern evident.

The building appears to be under-ventilated. A century ago, all buildings were constructed to have large windows, high ceilings, front porches, fireplaces or steam radiators. It has been only within the last decades that we've closed the windows and truly moved indoors. Conditioned air, must be humidified or dehumidified, filtered or circulated, heated or cooled in combinations. As a consequence, some building dwellers have found that the absence of a constant source of large volumes of fresh air elicits headache, fatigue, difficulty concentrating and other, equally immeasurable but real symptoms. These symptoms are related to build up of CO2 or other human and building castoffs. The symptoms abate with larger amounts of circulated air. The symptoms detailed in the ORES survey match this pattern. Our own inspection of the building encountered many rooms in the school that needed more air flow for comfort.

Another reported and frequent problem reported by staff and parents and found in the survey is nosebleeding (epistaxis). Nosebleeds are common in school-aged children. The two leading causes of nosebleeds are dry air and trauma (nose-picking). We know that the introduction of a dehumidifier last summer in response to the finding of mold resulted in dryer air this year compared to last. However, we found no significant difference between last year's experience and this year's with respect to nosebleeding. Regardless, rather than a sign of exposure to molds, nosebleeds are likely due to dry air. Dry air has been raised as a concern by the state's environmental review.

Beyond the survey, in direct interviews and in emails, teachers have reported an unusual clustering of students needing glasses. Twenty-five percent of children will develop refractive errors during these school years. The sudden increase in discovered refractive errors is due to the appropriate vigilance of the teachers for reading difficulties and then hyper-vigilance for others once the index cases were found. The continued surveillance of school-aged children for visual problems is encouraged, but there is no scientific or medical basis on which to blame a school's environmental for students needing eyeglasses.

Our recommendations continue to be:

1. Focus on the HVAC system and recalibrate air exchanges according to the guidelines in the engineer's reports;
2. Reassess the settings on the carry our dehumidification system to assure the best settings for each season of the year.

3. Take advantage of summertime school closings to continue to research possible causes of the symptoms. Invite official governmental and research agencies on iste for testing such as National Institute of Occupational Safety and Health (NIOSH), US Dept of Health and Human Services (USDHHS), and the Centers for Disease Control (CDC).

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