As researchers, it is important to discuss our research with the public, and these outreach activities give our scientist volunteers that opportunity while bringing the science to the community.

1. Pick a topic.
For each event, we pick a general topic that provides the framework for our conversations about alcohol and the brain. Past topics include brain development, brain protection (skull, CSF) and sensation versus perception. These topics are accessible to broad audiences – from preschoolers to adults – and can tie to alcohol through information or props, e.g. distortion goggles that simulate different blood alcohol levels.

2. Pick a venue.
We partner with a science museum or expo that will draw visitors. Libraries, schools, churches and clubs are also good venues.

3. Gather activities.
There are many great resources available online. For example, “sensation versus perception” can be illustrated via sensory illusions, which set the stage for the sensory illusion of the alcohol distortion goggles. An excellent prop for neuroscience is a real brain.

The human brain that we use is the star of the show, but a great alternative is a sheep brain purchased from a science supply store.

4. Recruit volunteers.
Universities are full of scientists at all levels who enjoy talking about neuroscience! Many of our volunteers are students, postdocs, staff or faculty in the Center, but we also recruit undergraduates. We recruit through listservs and word of mouth, and organize by using a web-based sign up.

5. Provide training.
Our activities are interactive and designed to promote conversation rather than “instruction.” We give our volunteers detailed written guidelines before the event that include questions they can use to engage the visitors.

Blood Alcohol Levels
Bean bag toss – under the influence
We have distortion goggles that shift your perception in ways that mimic high blood alcohol levels – can you do a simple bean-bag toss with these goggles on? Here’s a suggested action plan:
- Have the visitor try the bean bag toss without the goggles. (If it is very busy, skip this step.)
- Have them try again with a pair of goggles. They will almost surely throw the bag to the side of the goal. It is difficult for adults to compensate for this, but easier for kids. Everyone finds it hilarious.
- Plot their success rate on the graph. We’ll have success rate on the one axis with simulated BEAC on the other axis.
- Optional – if there is space, you can put a line on the floor with masking tape and ask them to walk on the line, or very close to the line without touching it (which may be harder).

Brain tricks – Sensation and Perception
Sound illusions. The McGurk effect shows us how what we see – lip reading – can override what we hear. It’s illustrated with a video of a person saying a sound, and then they might switch to another sound, in which you can hear the difference. But guess what? The person only said one word the entire time!

Load visitors through questions: What happens when you close your eyes? Why didn’t it seem funny to us that the sound didn’t match what we saw when we were watching the video? When would it be useful to be able to hear with our eyesight?

Smell illusions. This activity demonstrates a Stroop-like effect in which color affects what you smell. When you put an extract (e.g. lemon) into a balloon, the odor is able to pass through the latex. Our associations of scents and colors can influence what we think we smell. Participants come up to the station and are asked to tell us what scent they smell. A yellow balloon has been filled with a scent (lemon) and then a second yellow balloon is filled with a different scent (cherry). Most people will identify the first scent correctly as lemon, but they will also say that the second balloon (filled with cherry) also smells like lemon! We then tell them that their brain may have ‘tricked’ them – we usually identify the smell of lemon with the color yellow. If they identified both scents correctly, we can talk about how their brain didn’t get tricked but that some people get the scents incorrect and why this may happen in the brain.

Protect the Brain!
Name that skull. The first protection of the brain is a bone – the skull. The museum has several animal skulls (including a baby human and a toot ahianeal!). Visitors can guess what animal the skull came from, look at the surface of the skull up close with a microscope probe, and look at human skull models.

Mr. Egghead experiment. The last station illustrates how cerebrospinal fluid protects the brain. We will have raw eggs (the brain) that we put in plastic bags (meninges) and then into plastic Tupperware containers (the skull). When they shake the egg in the Tupperware, ask what they hear – does that sound good for the brain? We’ll show them how to even smash the egg in the Tupperware. Evidently the brain is not sufficiently protected.

Next, we give them a new egg, baggie and clean Tupperware. This time they fill the container with water (cerebrospinal fluid). Now what do they hear? Can they break the egg?

Public health messages. The exhibit shows how the body protects the brain, but we can do things to protect our brains, too. As we chat with kids and adults, we can reinforce healthy behaviors: wearing helmets, eating healthy food, protecting our brains from drugs and alcohol (or excessive alcohol in the case of adults).

Comment from graduate student: “My favorite part was talking to a teenage girl who had so many questions about how the brain worked that her parents had to literally drag her away from our booth. I felt very excited to see others with that type of enthusiasm for brain science. We collectively encouraged her to ask more questions and to even consider a career in science. I was really surprised to see that the children could make an instant connection with the hands on experiment about protecting their brain (egg).”

For volunteer instructions, please email Donita Robinson at DLR@unc.edu

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