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### PEDIATRIC COMPLICATIONS WITH TUBES

Short-term complications from the insertion of tubes, such as a minor ear infection, can generally be cleared up with antibiotics and drops. If the ears had been infected for a long period of time prior to the insertion of tubes, they may also drain continuously for several weeks after insertion of the tubes. This allows the mastoid (the reservoir behind the ear which connects to the middle ear), to drain and dry out. In some cases, the ear will continuously drain for over one month. If this occurs, then a CT scan of the mastoid bone is necessary in order to evaluate whether disease is persisting within the mastoid itself.

If a child has had tubes in place for six months, and suddenly the ear begins to drain, this may indicate a cold, or entry of water in the ear. Usually, this type of infection will resolve rapidly with antibiotics and drops. If the ear does not dry up, further investigation is required. If there appears to be a polyp around the base of the tube, it should be removed if possible, or the tube itself should be taken out. Most tubes can be removed easily in the office, under a surgical microscope without anesthesia. Polyps can also occur within the middle ear space, underneath the tube. Generally, the ear will dry after the tube is removed. If fluid reoccurs after the eardrum heals, re-insertion of the tubes may be indicated.

Some ear, nose and throat specialists advocate removing the tubes in the operating room, and patching the eardrum at the time of removal. The patch is generally made out of a gelatin sponge (Gel-foam), fat, or a small paper patch. This may be worthwhile when a tube has been in place for a prolonged period of time, especially in a child who does not allow cleaning of the ear in the office. Patching may not be necessary in all children. Usually, after the tubes are removed the drum will heal spontaneously without patching.

When tubes fall out or are rejected spontaneously, the eardrum almost always heals behind the tube. T tubes do not extrude by themselves. These have to be physically removed. After removal, over 90% of the defects in the eardrum will heal within one month. If the T tube has been in place for a prolonged period of time (over two years), the drum may be slower to heal. In most cases, the drum will eventually heal itself over a period of months. In some children (less than 1% of all who have had tubes inserted), the eardrum may not heal.

The proportion of permanent perforations increases directly with the number of tubes inserted in the past and the length that the current tube is left in position. High-risk cases for permanent perforations include those who have needed

multiple sets of tubes in the past. This small subset of children and adults may have permanent changes in the strength, thickness and blood supply of the eardrum.

There are instances, after the tube has fallen out or is removed, when the drum may not heal without surgical intervention. These permanent changes in the eardrum are largely due to the disease process itself. The eardrum with chronic fluid and recurring infections tends to become thin and atrophied with time. Surgical repair of the perforation is recommended in these cases. Before performing surgery, there should be reasonable expectation that the fluid problems have been cleared and that the patient is beyond the age of having Eustachian tube problems: the so-called maturity of Eustachian tube function. Since there is no reliable way to measure Eustachian tube function directly, the status of the opposite ear may be the only indicator of what can happen to the ear with the perforation, if it is repaired.

If the opposite ear has persistent infections and fluid problems, it may be advisable to deter the repair of the perforated eardrum until the opposite ear clears fluid and appears to have matured its eustachian tube function. One significant exception to this situation would be if the perforation were marginal, at the edge of the eardrum. In this case, prompt closure of the perforation may be necessary to prevent the formation of a cholesteatoma (cross reference). Repair of the eardrum may also be deferred in children who have undergone cleft palate repair, or who have other cranio-facial anomalies that are associated with prolonged poor Eustachian tube function.