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EXPLANATION OF RECOMMENDED ROUTINE TESTS AND IMMUNIZATIONS

Newborn screening is testing for rare but serious congenital conditions in which early treatment can either be life-saving or make a big difference in intelligence potential. The first such test was for phenylketonuria (**PKU**). Now we screen for over 30 diseases. This is done 2 days after birth and repeated at 2-3 weeks after birth.

Hemoglobin (**Hg**) is a blood test that can be taken from a finger stick and measures for anemia. Most mild anemias are from poor intake of iron in the diet, but anemia can also be a sign of blood loss or inborn problems with blood cells. We routinely check for anemia at 9 months and 3 years of age. Because dietary iron replacement may not keep up with blood loss from menstruation, it is a good idea for menstruating females to take iron or vitamin/iron supplements daily.

The **urinalysis (U/A)** is a group of tests on a sample of urine that can detect metabolic diseases like diabetes as well as kidney disorders or infections (infections require a urine culture for true confirmation). We will get a U/A if we suspect any such disorder, but also feel that it is a good screening tool since many of these problems may go unnoticed if it were not done. It is frequently not covered by insurance as a screening test, so we do it mostly when we have concerns.

The **audiogram** is an objective measure of your child's ability to hear various frequencies of sound. This should be done when a child has problems hearing or problems with speech. By 5 years of age, most children will be able to concentrate well enough to do the test that we have. A special test for hearing is offered on all babies in the nursery and is useful to rule out congenital hearing loss. This rare problem is best treated with hearing aids started within the first three months after birth.

Vision screenings with an eye chart can be done at checkups starting about five years of age. Your child's vision can deteriorate over a period of months at any age, but is more likely to change between 9 and 13 years of age. If there is a family history of lazy eye or amblyopia, your children should be seen by an eye doctor by the first or second birthday.

The **DTaP** vaccine protects against potentially life-threatening diseases of **diphtheria**, **tetanus** (lock-jaw), and **pertussis** (whooping cough). The vaccine has been used with great success since the 1940's, but was reformulated in the 1990's to a more purified (acellular) pertussis vaccine - thus the "aP". These newer DTaP vaccines are much better tolerated than the old (whole cell) pertussis vaccines and cause much less fever. It is administered in a primary series at 2, 4, and 6 months of age and given to boost the immunity at 18 months and at 4 years of age. A variation of this vaccine with less diphtheria and pertussis components (**Tdap**) is given at 11 years of age. In case of a tetanus prone wound (mainly dirty puncture wounds), a **Td** vaccine is recommended at the time of the wound if it has been over 5 years from the last tetanus shot.

Polio, the crippling disease that became most prevalent when sanitary conditions improved for the wealthy in the 1930's and 40's. It is now wiped out in our hemisphere thanks to vaccines. It is still present in the world and only a plane ride away. The oral polio vaccine was replaced by about 2001 with the killed form of polio vaccine, **IPV**, given in a series of four to five shots. It is combined with other vaccines presently. There is hope that polio can be eradicated from the world.

The **hepatitis B** vaccine (**HBV**) is a vaccine against the Hepatitis B virus, the cause of serum hepatitis. This virus is more prevalent in Asians and can cause serious, even deadly liver disease. It is not easily spread and is found in about 1% of adults in our community. Three doses generally provide good immunity. The vaccine has been encouraged for children by the immunization authorities at CDC and the American Academy of Pediatrics and is required by many states as well as by many colleges. The immunity provided in infancy hopefully will give lifetime protection from this potentially serious disease.

The **Hib** vaccine provides your child with immunity to the **Haemophilus influenzae type b** strain of bacteria. This bacteria used to be the number one cause of bacterial meningitis in children (about 20,000 cases per year in the U.S.), and also caused other serious infections of the bones, joints, or soft tissues requiring ten-day courses of intravenous antibiotics in the hospital for treatment. This vaccine came out in a polysaccharide form in the 1980's which helped the children over two-years old,

but it wasn't until the protein-conjugated form came out for infants about 1990 that a great impact in the disease was seen, such that this disease is now very rare.

The conjugate (using the same technology developed for the Hib vaccine) **pneumococcal vaccine (PCV-13)** covers 13 of the almost 100 strains of that germ. It has been effective in preventing serious pneumococcal diseases like meningitis, pneumonia, and bacteremia (germs in the blood). It has also been found to reduce the number and severity of ear infections in children. It is administered in a primary series at 2, 4, and 6 months, with a booster dose given at 12 months.

The **rotavirus vaccine (R)** became available in 2006 and protects against a common stomach virus that has been one of the most common causes of children getting sick enough to be admitted to the hospital (for vomiting, diarrhea, and dehydration). It is a live virus vaccine that has been extensively tested for safety, and has been on the market since 2006. It is only approved for infants up to 7 months of age. It is administered by mouth (not a shot) at 2, 4, and 6 months of age.

The **MMR** vaccine is a live virus vaccine that protects against **measles, mumps, and rubella**. The first of these diseases is very contagious and potentially deadly. Measles also is notorious for causing a serious viral pneumonia as well as encephalitis (inflammation of the brain). Mumps is a viral infection mostly affecting the large salivary glands, but can also affect the sex organs (gonads) and can cause sterility, viral meningitis, and deafness. Rubella is not considered a serious disease in normal children, but causes very serious birth defects in unborn children especially if the mother gets the disease during her first trimester. The MMR vaccine usually gives long-term immunity, but doesn't always take the first time, and the immunity can gradually wear down some, so two doses are recommended; we give it at 12 and 48 months of age.

The **chickenpox (VZV)** vaccine came out in 1995 and has made this disease rare today. It was developed for several reasons; time missed from school and work, unusual complications like encephalitis or life-threatening secondary infections (up to 100 children used to die from chickenpox yearly in the U.S.), more severe disease in older children and adults, and shingles occurring in over 10% of people who have had chickenpox (usually many years later). This vaccine has worked well, but a number of children have still gotten light cases of chickenpox even after being vaccinated and rarely children get full-blown cases, so the CDC recommended in 2006 that a second dose be given. When possible, we will use a combination of MMR and VZV (**MMRV**) given at 12 and 48 months of age. There is less pain with the MMRV than with the MMR.

In 2006, CDC also recommended routine vaccination down to 1 year of age against **hepatitis A** with a hepatitis A vaccine (**HAV**). This disease is caused by a virus that is spread by contaminated food or water, and infects the liver, causing nausea, fatigue, and jaundice. Most cases in the U.S. are acquired from imported food. It can be deadly, but most people get over it. Two doses of the vaccine given at least 6 months apart give long-term protection.

In recent years, a conjugate vaccine was developed against a potentially deadly germ called **meningococcus**. It incorporates 4 strains and gives better immunity than the previous polysaccharide type vaccine. This germ can cause blood infections and/or meningitis and can cause death in less than 24 hours from the onset of symptoms. The meningococcal conjugate vaccine with 4 strains (**MCV-4**), is recommended down to 11 years of age and gives protection for at least 5 years. The greatest risk for this disease is in the teens and early twenties in the U.S., or in travelers to countries where it is more prevalent. A second dose is recommended at 16 years of age. Newer type B meningococcal vaccines are becoming available and may be something we will offer some day.

The **flu** vaccine is available for children down to 6 months of age, with the live form (FluMist) available down to 2 years of age. They are usually effective in preventing influenza which can be a very severe illness. A study done at Field Pediatrics, PC demonstrated that the vaccine is much likelier to protect against disease in individuals who have had flu before. This may be due to genetic factors that affect susceptibility to the virus.

The newest vaccine is the **human papillomavirus vaccine (HPV)**. It can prevent most genital warts and most cases of cervical cancer, which causes thousands of deaths every year in this country. The vaccine is given in 2 or 3 doses, and is recommended for boys and girls to receive it prior to potential sexual exposure to this common sexually transmitted virus. The vaccine does not provide any protection for virus already contracted and the immune system is more responsive to the vaccine in the teen years than later. We do have concern that an ingredient in the HPV vaccine called polysorbate 80 might cause problems with ovaries that could be as severe as premature menopause. See the ACPeds statement of concern that Dr. Scott wrote.