

[“Baby Olivia” Video Accuracy](#)

Context

[Baby Olivia](#) is a medically accurate, animated glimpse of human life from the moment of fertilization. This story details her growth as she progresses from one developmental stage to the next in preparation for her continued life outside of the womb.

Baby Olivia was created by Live Action in collaboration with a panel of medical doctors, including experts in embryonic and fetal development — [Dr. David Bolender](#); [Dr. Donna Harrison](#); [Dr. Tara Sander Lee](#); [Dr. Katrina Furth](#); Dr. [Michelle Cretella](#); and Dr. [Jeffrey Barrows, DO, MA](#) — who each endorsed the project.

The following are the facts stated in the [Baby Olivia](#) video, in chronological order, with the specific source links and text supporting each claim. It is important to note that all gestational markers are [calculated](#) relative to fertilization (also called “conception”), not to the last menstrual period (LMP), which is often used elsewhere and which adds approximately two weeks.

Many of the developmental facts shared in *Baby Olivia* are sourced from the [Endowment for Human Development](#), which is “a nonprofit organization dedicated to improving health science education and public health.” Its website [states](#) that it is “committed to [neutrality](#) regarding all controversial bioethical issues,” adding, “Our board of directors, board of advisors, staff, and volunteers includes accomplished educators, researchers, authors, programmers, and clinicians from a variety of scientific and business disciplines who share the common goal of improving lifelong health through prenatal development-based education.” Science educators across the United States have endorsed the organization’s award-winning content, which National Geographic also distributes.

Certified OB/GYN Kathi Aultman, MD, FACOG, has [said](#): “*Olivia* is a spectacular and medically accurate portrayal of the development of a baby girl within the womb. It is based on information from the Endowment for Human Development, a highly respected scientific source on embryology and fetal development. *Olivia* draws back the curtain on the womb giving us a realistic glimpse of the baby within. As a retired OB/GYN, I wish this had been available for my patients.”

Dr. Jeffrey Barrows, DO, MA, of the Christian Medical & Dental Associations said: “This video is an accurate and vivid portrayal of the intrauterine development of the baby. If I were still practicing obstetrics, I would be showing this to all of my pregnant patients.”

The [Charlotte Lozier Institute](#), a scientific and medical research organization, [said](#): “*Olivia* is the beautiful story – based on the latest scientific research – of a child’s beginnings in her mother’s womb, from conception until birth. The attention to detail and scientific accuracy of the

developing child are astounding. Sharing this life journey should open the eyes of anyone who doubts that preborn babies are real human beings, just like you and me.”

Line-by-Line Corroboration

1). “This is the moment that life begins.” (0:19) This statement refers to fertilization.

The Endowment for Human Development (EHD) [states](#): “Biologically speaking, fertilization (or conception) is the beginning of human development.”

The journal Nature stated in its January 2010 issue: “The life cycle of mammals begins when a sperm enters an egg.” The textbook Patten’s Foundations of Embryology (6th ed., p. 3) likewise states: “The time of fertilization represents the starting point in the life history, or ontogeny, of the individual.” These quotes and many other similar statements from embryology textbooks can be found in this Live Action News [article](#).

2). “At fertilization, her gender, ethnicity, hair color, eye color, and countless traits are already determined.” (0:25)

EHD [states](#): “The zygote... contains 46 unique chromosomes with the entire genetic blueprint of a new individual.”

[Science Daily](#) notes that “[t]he sex of a baby is determined by its chromosome make-up at conception. An embryo with two X chromosomes will produce a girl, while an embryo with an X-Y combination results in a boy.”

[WebMD](#) also states: “At the moment of fertilization, the baby’s genetic makeup is complete, including whether it’s a boy or girl.”

3). “She begins to implant in the uterus around 1 week after fertilization.” (0:34)

EHD [states](#): “Implantation is the process whereby the early embryo embeds into the inner wall of the mother’s uterus. Implantation begins about 6 days after fertilization and is complete by about 12 days.”

[UCSF Health](#) also notes: “Once the embryo reaches the blastocyst stage, approximately five to six days after fertilization, it hatches out of its zona pellucida and begins the process of implantation in the uterus.”

4). “At 3 weeks and 1 day, just 22 days after fertilization, Olivia’s heartbeat can be detected.” (0:48)

EHD [states](#): “About 3 weeks, one day after fertilization ... the heart first begins to beat[.]”

[Merck Manuals](#) also [stated](#): “The heart and major blood vessels begin to develop earlier—by about day 16. The heart begins to pump fluid through blood vessels by day 20, and the first red blood cells appear the next day.”

In a 2020 [study](#) published in the journal *Fetal Diagnosis and Therapy*, Oxford-affiliated researchers [Cheryl Mei Jun Tan](#) and [Adam James Lewandowski](#) wrote: “By the end of gestational week 3, passive oxygen diffusion becomes insufficient to support metabolism of the developing embryo, and thus the fetal heart becomes vital for oxygen and nutrient distribution. The initiation of the first heart beat via the primitive heart tube begins at gestational day 22, followed by active fetal blood circulation by the end of week 4.”

VeryWell Family similarly [states](#): “A baby's heart begins to beat around 22 days after conception.”

5). “The buds of her arms and legs appear by 4 weeks.” (1:04)

EHD [states](#): “Upper and lower limb buds appear by four weeks.”

[Planned Parenthood](#) similarly notes that “[b]uds for arms and legs develop” during week 5-6 LMP (or week 3-4 post-fertilization).

[Mayo Clinic](#) also notes: “By the end of the sixth week of pregnancy — four weeks after conception — small buds appear that will become arms.”

6). “She begins to move between 5 and 6 weeks, with both spontaneous and reflexive movements.” (1:11)

EHD [states](#): “...the embryo begins to move between 5 and 6 weeks. The embryo's first movements are both spontaneous and reflexive.”

Developmental Medicine & Child Neurology published a [study](#) which stated: “The embryo starts moving by 7.5 week's gestation [5.5 weeks post-fertilization].”

7). “At 6 weeks from fertilization, her brain activity can be recorded, and bone formation begins.” (1:17)

EHD [states](#): “The embryo has brainwaves by 6 weeks, 2 days! ... Individualized brainwaves recorded via electroencephalogram, or EEG, have been reported as early as 6 weeks, 2 days. ... Bone formation begins between 6 and 7 weeks, starting with the clavicle, or collar bone, and the upper and lower jaw.”

8). “She can bring her hands together at 7 ½ weeks. Separate fingers and toes emerge. She can also begin to hiccup.” (1:27)

EHD [states](#): “Also by 7½ weeks, the hands can be brought together[.]” In a table under the heading “A Summary of Hand and Foot Development” on the same page, the text “Fingers separate; Hands and feet come together” appears in a box designated “7 ½ weeks.” On another [page](#), EHD states: “Also by 7 weeks ... hiccups begin.”

[Mayo Clinic](#) also states that “eight weeks after conception ... your baby's toes and fingers lose their webbing and become longer.”

According to a [study](#) published in *Developmental Medicine & Child Neurology*, “a number of movement patterns including general movements, isolated limb and head movements, hiccup, and breathing movements, appear” at 9.5-10.5 weeks’ gestation (or 7.5-8.5 weeks post-fertilization).

9). “At the beginning of the 9th week, Olivia will have grown from a single cell into nearly 1 billion cells, and she is now called a fetus. She will suck her thumb and swallow, grasp an object, touch her face, sigh, and stretch.” (1:41)

EHD [states](#): “8 weeks marks the end of the embryonic period. During this time, the human embryo has grown from a single cell into nearly 1 billion cells[.]” On another [page](#), EHD states: “By 9 weeks thumb sucking begins and the fetus may swallow amniotic fluid. The fetus can also grasp an object, move the head forward and back, open and close the jaw, move the tongue, sigh, and stretch.”

[News Medical](#) notes: “At 9 weeks yawns and stretches are visible on ultrasound.”

[Planned Parenthood](#) notes: “The embryo develops into a fetus after 10 weeks” LMP (or 8 weeks post-fertilization).

10). “At 11 weeks, she is playing in the womb, moving her body and exploring her environment.” (1:57)

EHD [states](#) that, by week 8, “Slowly or rapidly, singularly or repetitively, spontaneously or reflexively, the embryo continues to practice the movements begun earlier and to move in new ways.” In a photo caption on another [page](#), EHD states: “Arms and legs - already very active in the 12-week fetus – continue growing for a long time to come.”

11). “Her taste bud cells have matured by week 12, but are still scattered throughout her mouth.” (2:03)

EHD [states](#): “Between 11 and 12 weeks ... [t]he taste bud cells that appeared by 7 weeks have matured into discrete taste buds, but are still scattered throughout the mouth.”

[Psychological Science](#) has reported that “[i]n human fetuses, taste buds develop anatomically at 8 weeks’ gestation [6 weeks post-fertilization] and can detect tastants from 14 weeks’ gestation [12 weeks post-fertilization].”

12). “Her mother will first sense Olivia’s movement between 14 and 18 weeks — an event called quickening.” (2:10)

EHD [states](#): “[A] pregnant woman first senses fetal movement between 14 and 18 weeks. Traditionally, this event has been called quickening.”

The American College of Obstetricians and Gynecologists’ book *Your Pregnancy and Childbirth* (7th ed., p.96) notes: “Some women, especially those who have had a baby before, feel quickening as early as 16 weeks of pregnancy.”

13). “Beginning at 18 weeks, ultrasounds show speaking movements in her voice box.” (2:19)

EHD [states](#): “Beginning at 18 weeks, ultrasound scans show a distinct type of motion in the fetal voice box, or larynx, similar to movements made during speaking.”

14). “Around 20 weeks, with a lot of help, babies have survived outside the womb.” (2:27)

The [Washington Post](#) relates the story of Richard Hutchinson, whose mother was “21 weeks and two days pregnant” using the LMP method of gestational calculation (equivalent to just over 19 weeks post-fertilization) when she gave birth to him.

[Curtis Means](#) was born at 21 weeks and 1 day (19 weeks and 1 day post-fertilization). He holds the current [record](#) for the youngest preemie to survive outside the womb.

Other [research](#) affirms the increasing survival rate of preemies born at 22 weeks LMP.

15). “At 27 weeks, her eyes are responding to light. She can recognize her parents’ voices, and will even recognize lullabies and stories.” (2:34)

EHD [states](#): “The pupils dilate and constrict in response to light as early as 27 weeks.” On another [page](#), it states: “By 20 weeks [the cochlea] reaches adult size within the fully developed inner ear. From now on, the fetus will respond to a growing medley of sounds.” On a third [page](#), EHD states: “The fetus hears numerous sounds before birth, with the mother’s voice and heartbeat dominating other sounds. Studies show that after months of listening to the mother’s voice, the newborn prefers her voice to any other. The newborn also prefers female voices to male voices and familiar lullabies heard before birth to new lullabies after birth. Newborns can distinguish prose passages heard during the last 6 weeks of pregnancy from new passages, providing additional evidence of in utero memory formation and learning.”

[Mayo Clinic](#) similarly states: “By the end of the 25th week of pregnancy — 23 weeks after conception — your baby might be able to respond to your voice with movement.”

[BabyCenter](#) notes that “after 23 weeks, your little one will be able to make out your voice and other sounds from outside the womb.”

16). “Olivia has gone on an amazing journey during these last 9 months. She will soon signal to her mother that it is time for delivery[.]” (2:45)

EHD [states](#): “The fetus initiates labor resulting in the transition from fetus to newborn.” A photo caption on the same page reads: “The fetus, not the mother, determines when labor begins and chooses the birthing position (head first vs. feet first).”

[Planned Parenthood](#) states that a woman “will probably give birth around” week 39-40 LMP (or week 37-38 post-fertilization).