

Abstract Submitted
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The fluid dynamics of human birth ANDREA LEHN, MEGAN C. LEFTWICH, The George Washington University — This study investigates the fluid dynamics associated with the human birth process. Specifically, we investigate the role of the viscosity of the amniotic fluid in transferring force from the contracting uterus to the fetus during delivery. This experimental work uses an approximate uterus and dilated cervix—fabricated with liquid latex—filled with a fluid of known viscosity and an oblong solid fetus. The force required to extract the fetus is recorded for several values of amniotic viscosity. The study looks at both pull-out force values (where the fetus is pulled from outside the uterus) and push-out force values (where pressure in the experimental uterus is used to remove the fetus). In addition to the viscosity study, we also investigate the increased force required to deliver an offset fetus by tilting the major axis of the oblong fetus and repeating the pull-and push-out experiments. This study will provide knowledge about the fundamental fluid dynamic processes involved in human birth.

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