

The Apgar Score: Advancing the Frontier of Neonatal Medicine

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Group Exhibit

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When we brainstormed our National History Day (NHD) topic, we searched for a topic that impacted America, but was not often discussed. We discovered the Apgar scoring system, devised by Dr. Virginia Apgar in 1952, which is a test that evaluates newborns' health. The project speaks to us personally because we are interested in the medical aspect of this topic. Our topic connects to the theme *Frontiers in History: People, Places, Ideas* because the Apgar assessment immensely advanced the **frontier** of neonatal medicine.

Our research started by determining how infant mortality rates decreased once the Apgar test was implemented. One of our most useful sources was an interview with Amy Lage, a registered nurse in the NICU at the University of Iowa Hospitals and Clinics. Amy uses the Apgar score daily to assess newborns. From this interview, we obtained information on the Apgar scores used today and how it is very beneficial for nurses. Furthermore, we learned how the Apgar score is the most efficient way to check a newborn's response to the birthing process. After the state competition, we carefully reviewed the judges' comments. They encouraged us to include more information on the Apgar score's legacy and impact. In response, we conducted multiple interviews. We exchanged emails with Dr. Edward Bell, a Professor of Pediatrics-Neonatology at the University of Iowa. Dr. Bell's input gave us an understanding of how doctors today respond to a newborn's Apgar score. We continued our research by communicating with Dr. Samir Alabsi, a neonatologist and medical director of the neonatal transport team at the Neonatal Intensive Care Unit in Blank Children's Hospital. By conducting this interview we gained information on how the Apgar score is the quickest and easiest way to assess a newborn.

We chose to create an exhibit board because we felt our information was best presented in a variety of mediums. We wanted to combine visual, written, and hands-on information to give

the audience a well-rounded picture of the Apgar score. In our exhibit, you can view the graph that shows the decrease in newborn deaths at your leisure rather than having it flash by quickly as it would in a documentary. Participating in National History Day has taught us about the vital role that quality research plays in our analysis. Throughout the editing process, we gained invaluable knowledge concerning what makes information helpful in supporting a claim, as well as when to question information further.

We researched Dr. Apgar's scoring system for newborns not only because its creation was a critical **frontier** in neonatal medicine, but because we believe the general public is unaware of its critical contribution to decreasing infant mortality. In the early 1900s, the standard practice was to focus on the mother's health over the newborn's, resulting in numerous deaths. Due to the Apgar score's implementation, medical professionals today are aware of a newborn's immediate needs and the applicable protocols to ensure healthy babies. Performing an Apgar test after birth is the optimal method to evaluate newborns.

Annotated Bibliography

Primary Sources

Alabsi, Dr.Samir Y. Email interview. 6 Apr. 2023.

We interviewed Dr. Samir Y. Alabsi MD, a neonatologist and medical director of a neonatal transport team, Neonatal Intensive Care Unit at Blank Children's Hospital in Des Moines, Iowa. We asked him multiple questions about his opinions and thoughts on the Apgar score and its impact on neonatal medicine.

Andescavage, Nickie. Video Conference interview.

We had the opportunity to interview NICU neonatologist Dr. Andescavage, MD, an Assistant Professor of Pediatrics at George Washington University School of Medicine and Health Sciences. This important interview gave us more information about how the Apgar score is a critical assessment, but is often misconstrued as the Apgar score system is not meant to predict the long-term health of the newborn. This information is incorporated into the long-term impact section of our project.

Apgar, Virginia. "Apgar Score: A Lecture by Dr. Virginia Apgar [Podcast]."Lecture.

This podcast gave us the first-person perspective of Dr. Virginia Apgar and helped us appreciate her expertise concerning the Apgar score. Dr. Apgar explained a similar test that was made in Europe that was not as successful. This was used in the heart of the story section of our project.

Apgar, Virginia. *The Newborn (Apgar) Scoring System*. W.B. Saunders Company, 1966.

National Library of Medicine,

profiles.nlm.nih.gov/spotlight/cp/catalog/nlm:nlmuid-101584647X146-doc. Accessed

9 May 2023.

Reading through this pamphlet taught us who is qualified to conduct the Apgar score and how it is actually not advised to have the service provider who performed the birth give the test. Dr. Apgar recommends someone else perform the test because of the bond created between the newborn and the provider of the delivery. This information is within the Implementation section of our project.

Barr, Andria. Email interview. 24 Jan. 2023.

By conducting this interview it was helpful to be able to ask questions of someone very familiar with the Apgar score that we could not answer from a website. The information she gave us is used in the long-term impact section of our project.

Bell, Edward. Email interview. 5 Apr. 2023.

Dr. Edward Bell is a professor of Pediatrics-Neonatology at the University of Iowa. We emailed him and received some very helpful information about the Apgar score; including detailed information on how the Apgar score helps notify doctors or nurses what is going on with the newborn and get it into the NICU if necessary. This information went into the long-term impact section of our project.

Dr. Ahuja. Email interview. Conducted by Hadley Appel et al., 6 Apr. 2023.

We sent Dr. Ahujar, a pediatrician in Bettendorf, Iowa, several questions regarding how the Apgar score results help the newborn's doctor make care decisions. Her helpful information has gone into the long-term impact section of our project.

Dr. Virginia Apgar: Celebrating Women's National History Month. Produced by March of Dimes, Youtube, 2019.

By viewing this video we gained more information concerning who inspired Dr. Apgar to keep working in the medical field even though she did have to overcome many challenges because of her gender, like her professor Mary L. Kays. This information has gone into the before section of our project.

Dr. Virginia Apgar: The Woman behind the Apgar Score. Arts and Culture, artsandculture.google.com/story/dr-virginia-apgar-the-woman-behind-the-apgar-score-national-women-s-hall-of-fame/xgVxylfnmvRdLA?hl=en. Accessed 10 Dec. 2022.

We have the original photo of the Apgar test from this website. This was beneficial in the heart of the story, showing how creative and unique the Apgar test is.

Hospital Management. *Englewood's Nursery in 1930*. 1930, Hospital Management.

This picture gave us insight into how much medicine has changed and how newborns were taken care of in the early 20th century.

"Letter from Virginia Apgar to R.S Ikonen." *National Library of Medicine*,

profiles.nlm.nih.gov/spotlight/cp/catalog/nlm:nlmuid-101584647X100-doc. Accessed 1 Jan. 2023.

This letter from Dr. Virginia Apgar explains the actual intentions of the Apgar Test and how it is being developed even more in 1974 from 1952 when it was first made. We used this information in the Short-Term impact.

Library of Congress. *Dr. Virginia Apgar*. *Google Arts and Culture*,

artsandculture.google.com/asset/dr-virginia-apgar-library-of-congress/TwG-Q3Ae-1clTw?hl=en. Accessed 18 Nov. 2022.

This image shows one step that they used during the Apgar test. They are checking the newborn's heartbeat to see if it is vital. We used this in the short-term impact section of our project.

Mount Holyoke College. *Virginia Apgar Honored as Woman of the Year*. 14 May 1973.

National Library of Medicine, 14 May 1973, [profiles.nlm.nih.gov/ 101584647X40](https://profiles.nlm.nih.gov/101584647X40). Accessed 27 Mar. 2023.

By viewing this image we see how not only did Dr. Apgar create the Apgar Score and save many lives, but she was also a large feminist and fought for women's rights. This information has gone into the long-term impact section of our project.

The National Foundation-March of Dimes. Virginia Apgar Attending Newborn Baby.

National Library of Medicine, 23 Dec. 1959, [profiles.nlm.nih.gov/](https://profiles.nlm.nih.gov/spotlight/cp/catalog.nlm:nlmuid-101584647X50-img)

[spotlight/cp/catalog.nlm:nlmuid-101584647X50-img](https://profiles.nlm.nih.gov/spotlight/cp/catalog.nlm:nlmuid-101584647X50-img). Accessed 5 Apr. 2023.

By viewing this image we can see a step of the original Apgar test taking place.

This photo has gone on our board and the information has gone in our right after section in our project.

Newborns Staying in Hospital Nursery. Mar. 1947, Provident Hospital, Chicago, Illinois.

By viewing this photo we see how newborns were treated after the birthing process in the mid-1900s. This information has gone into the right-before section of our project.

Resuscitation Labs. *Accurate Apgar Scoring: A Proposal for a New Method of Evaluation of the Newborn Infant*. Mount Holyoke College, 1968. *National Library of Medicine*, profiles.nlm.nih.gov/spotlight/cp/catalog.nlm:nlmuid-101584647X101-doc. Accessed 8 Apr. 2023.

This pamphlet was part of an exhibit at the Twenty-Second Postgraduate Assembly in Anesthesiology, 1968. By looking through this pamphlet we gained information about how after the Apgar score was created it did evolve over time.

"The Role of the Anesthesiologist in Reducing Neonatal Mortality." *National Library of Medicine*, profiles.nlm.nih.gov/spotlight/cp/catalog/nlm:nlmuid-101584647X139-doc. Accessed 1 Jan. 2023.

From this website, we collected information on the mortality rate of newborns 2 years later after it was first created. It shows that newborns' mortality rate increased from the Apgar Test. This was used in the short-term impact section.

Shanks, Ann Zane. *Virginia Apgar*. 1966. *Smithsonian Learning Lab*, learninglab.si.edu/resources/view/215194#more-info. Accessed 8 Apr. 2023.

By viewing this image we saw how Dr. Apgar continued to teach more about the Apgar score. This information has gone into the short-term impact section of our project.

Smith, Frank. "Apgar Scoring Method Helps Forecast Newborn Infant's Chances of Survival." *The NIH Record*, Aug. 1964, p. 1. PDF.

When we read through this newspaper article, it showed us that the Apgar score truly changed the face of medicine and it did not just get put to the side it became something every doctor and nurse used and trusted.

"Virginia Apgar." *Apgar Test*. *Linda Hall Library*, www.lindahall.org/about/news/scientist-of-the-day/virginia-Apgar. Accessed 9 Nov. 2022.

This website had the original newspaper Virginia Apgar wrote to first explain her test and how it was going to help newborns. We used this website in the middle of our project because this describes her life and how she impacted the world when she first started this test.

Virginia Apgar Lecturing at a Meeting in Hochst, Germany. June 1966. National Library of Medicine, profiles.nlm.nih.gov/spotlight/cp/catalog.nlm.nlmuid-101584647X12-img. Accessed 8 Apr. 2023.

By viewing this image we gained an understanding of how influential Dr. Virginia Apgar truly was and how her creation of the Apgar score is truly beneficial. This information has gone into our long-term impact.

Virginia Apgar Lecturing at a Meeting in Tokyo. Aug. 1968. National Library of Medicine, profiles.nlm.nih.gov/spotlight/cp/catalog.nlm.nlmuid-101584647X13-img. Accessed 8 Apr. 2023.

By viewing this image we gained more information about how the Apgar score truly did affect the whole world positively. This information has gone into the long-after section of our project.

Virginia Apgar Lecturing on Resuscitation. 1964. National Library of Medicine.

By viewing this photo it gave us insight on what Virginia Apgar took part in after she finalized the Apgar Score. This information has gone into the short-term impact section of our project.

"Virginia Apgar." *March Dimes*, www.youtube.com/watch?v=whQIhiYOR_Q.

This video helped us show how Virginia Apgar has developed her test so well with people who inspire her. This was used in the right before section because this shows what led up to Virginia creating the test from those that inspired her.

***Virginia Apgar. March of Dimes*, www.marchofdimes.org/virginia-apgar-md.**

This image is Virginia Apgar performing the Apgar Test on a newborn baby. From using this image we were able to show that the Apgar Test is performed directly after birth.

***Virginia Apgar (1909–1974)*. Arizona State University. School of Life Sciences. Center for Biology and Society. Embryo Project Encyclopedia., 16 Feb. 2017, embryo.asu.edu/pages/virginia-apgar-1909-1974. Accessed 4 Nov. 2022.**

We used this website to understand Virginia Apgar's journey throughout discovering and learning to prevent birth defects. We used this in the beginning and at the heart of our project because it shows us how she came about to be influential to many women.

***Virginia Apgar Teaching at Columbia-Presbyterian Medical Center. 1950's. National Library of Medicine*, profiles.nlm.nih.gov/spotlight/cp/catalog/nlm:nlmuid-101584647X10-img. Accessed 8 Apr. 2023.**

Viewing this image it gave us a deeper understanding of what Dr. Apgar did after the Apgar score was implemented throughout hospitals. This information has gone into the right-after section of our project.

What-When-How In Depth Tutorials and Information. Virginia Apgar Testing a Newborn for Any Health Complications. *What-When-How*, [what-when-how.com/scientists/apgar-virginia-1909-1974-american-physician-scientist/](https://www.what-when-how.com/scientists/apgar-virginia-1909-1974-american-physician-scientist/). Accessed 8 Apr. 2023.

By viewing this image we saw different things doctors and nurses could perform on the baby during the Apgar score to determine the newborn's health. This information has gone into the short-term impact section of our project.

Secondary Sources

Abboud, Carolina J. "Virginia Apgar (1904-1974)." *The Embryo Project Encyclopedia*, 16

Feb. 2017, embryo.asu.edu/pages/virginia-apgar-1909-1974. Accessed 1 Dec. 2022.

By reading this article it gave us more knowledge on how the Apgar Score Test was made and everyone that was involved. Including Virginia's friend Stanley James who was a Pediatrician. This is a part of the before section of our document.

American Pregnancy Association. "Your Child's First Test: The APGAR." *American*

***Pregnancy Association*, edited by American Pregnancy Association,**

americanpregnancy.org/healthy-pregnancy/labor-and-birth/apgar-test/. Accessed 18

Nov. 2022.

The purpose of this article was for us to better understand the Apgar Test and how they have changed it with the new technology and better resources. This has gone into the long-term section of our project.

Apel, Melanie Ann. *Virginia Apgar Innovative Female Physician and Inventor of the Apgar*

***Score*. New York City, The Rosen Publishing Group Inc., 2004.**

By reading this book it has helped us learn more about the original idea of the Apgar Score at its earliest and how it has also changed over time. This has gone into our short-term impact but also our long-term.

The Apgar Score.

www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2015/10/the-apgar-score#:~:text=In%201952%2C%20Dr.,intervention%20to%20establish%20breathing%201. Accessed 9 Dec. 2022.

This website explained to us why Virginia Apgar thought the Apgar score was something that needed to be developed and why it was more specific and helpful than how they were previously diagnosing newborns. This has gone into the heart of the story section of our project.

"Apgar Score." *Cleveland Clinic,*

my.clevelandclinic.org/health/diagnostics/23094-apgar-score. Accessed 18 Nov. 2022.

This website helped us know what the Apgar numbers represent and what is a good score when a baby comes out. We used this website at the heart of the story.

"The Apgar Score Has Survived the Test of Time." *Anesthesiology,*

pubs.asahq.org/anesthesiology/article/102/4/855/7394/The-Apgar-Score-Has-Survived-the-Test-of-Time. Accessed 10 Dec. 2022.

We used this website to obtain information about the steps before the Apgar test was first created and what Virginia Apgar had to do for the test to become true.

This information we collected was used in the right-before section.

"Apgar scores are less predictive of infant mortality for Black babies than white ones, study finds." *Stats News,*

www.statnews.com/2022/07/12/apgar-scores-less-predictive-of-infant-mortality-for-black-babies/. Accessed 11 Jan. 2023.

We used this website to find out how the Apgar Test affected African American babies in a different way than white babies. This information was used in the short-term impact section of our project.

Blakemore, Erin. "The Doctor Who Saved Countless Newborn Babies." *Time*, edited by Time, 29 Aug. 2016, time.com/4460720/virginia-apgar/. Accessed 11 Jan. 2023.

By viewing this article we got more insight into the statistics that came with the Apgar score. This information has gone into the long-term impact section of our project.

B M J. "Apgar Scores 'Within the Normal Range' Linked to Higher Risks of Illness and Death." *BMJ, Journal: The BMJ*, 5 July 2019, www.bmj.com/company/newsroom/apgar-scores-within-the-normal-range-linked-to-higher-risks-of-illness-and-death/. Accessed 9 Dec. 2022.

This website informed us about how throughout 1999 to 2016 a group of researchers in Sweden analyzed 1.5 million babies and found that even babies who had a Apgar score that was considered normal (7-9) were still at risk of severe illnesses and death. This information has gone into the long-term impact category of our project.

Casey, MD, Brian M., et al. "The Continuing Value of the Apgar Score for the Assessment of Newborn Infants." *The New England Journal of Medicine*, edited by NEJM, NEJM group, 15 Feb. 2001, www.nejm.org/doi/full/10.1056/NEJM200102153440701. Accessed 5 May 2023.

By viewing this website we were provided with valuable information and statistical graphs showing how the Apgar Score connects to neonatal death rates. This information has gone into the long-term impact section of our project. The image we used from this website can be seen under New Innovations.

CDC Weekly. "Quick Stats: Infant, Neonatal, and Post Mortality Rates* --- United States. 1940-2006." *CDC, USA.gov*, 19 June 2019, www.cdc.gov/mmwr/preview/mmwrhtml/mm5823a4.htm#:~:text=In%20the%20United%20States%2C%20the,1940%20to%206.7%20in%202006. Accessed 19 Jan. 2023.

By using this website we were given more statistics on how the mortality rate of newborns decreased. This information has gone into the long-term impact.

Charlotte Hilton Anderson. "What It Was Like in Every Decade Since the 1900's." *Redbook*, 28 July 2016, www.redbookmag.com/body/pregnancy-fertility/g3551/what-it-was-like-giving-birth-in-every-decade/?slide=4. Accessed 19 Apr. 2023.

From this website we gathered pictures. These pictures show how the birthing process was in the early 1900s. These pictures are in the long-before section of our project.

Committee on Obstetric Practice. "The Apgar Score." *ACOG*, edited by ACOG Committee Opinion, American College of Obstetricians and Gynecologists, Oct. 2015, [www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2015/10/the-apgar-score#:~:text=concurrent%20resuscitative%20interventions-,Introduction,was%20published%20in%201958%202](http://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2015/10/the-apgar-score#:~:text=concurrent%20resuscitative%20interventions-,Introduction,was%20published%20in%201958%202.). Accessed 10 Jan. 2023.

By viewing this website we were given more insight into the limitations of the Apgar score, and how it is only there to evaluate the newborn's health at the moment in time and cannot detect things that might happen in the future. This information has gone into the long-term impact section of our project.

Dr. Virginia Apgar: The woman behind the Apgar Score.

artsandculture.google.com/story/dr-virginia-apgar-the-woman-behind-the-apgar-score-national-women-s-hall-of-fame/xgVxylfnmvRdLA?hl=en. Accessed 18 Nov. 2022.

This website teaches us a lot about how Virginia Apgar created the Apgar score and why. We used this at the heart of our project to explain why something like this was necessary in medicine.

**"Dr. Virginia Apgar: The Woman behind the Apgar Score." *Arts and Culture*,
artsandculture.google.com/story/dr-virginia-apgar-the-woman-behind-the-apgar-score-national-women-s-hall-of-fame/xgVxylfnmvRdLA?hl=en. Accessed 16 Jan.
 2023.**

This website gave us a quote that Virginia Apgar said to the newborns before doing the Apgar Test. "Nobody, but nobody, is going to stop breathing on me."
 We used this in the short-term impact section of our exhibit.

**The Editors of Encyclopedia Britannica. "Virginia Apgar American Physician." *Britannica*,
 edited by Britannica, Encyclopedia of Britannica, 3 Aug. 2022,
www.britannica.com/topic/Mount-Holyoke-College. Accessed 8 Nov. 2022.**

We used this website to learn what led Apgar to create the Apgar Score System.
 Also, how the Apgar score continues to save many newborns' lives every day.
 This has gone into the before and after part of our project.

**"The First Minute of Life: The Development and Legacy of the Apgar Score." Casa
 Assets,
www.cas.ca/CASAssets/Documents/Awards-Grants/69_MedicalStudentPrize.pdf.
 Accessed 24 Mar. 2023.**

This website had many new innovations that the Apgar score influenced and inspired. This website was used in the long-term impact section of our exhibit.

Health Matters Stories of Science, Care, and Wellness. "It Happened Here: The Apgar Score." *New York Presbyterian*, edited by New York Presbyterian, New York Presbyterian: Health Matters, healthmatters.nyp.org/apgar-score/#:~:text=%E2%80%9CIt%20was%20essentially%20the%20birth,clinical%20neonatology%2C%E2%80%9D%20Smiley%20say. Accessed 9 Jan. 2023.

By reading this article we gained another perspective on what health care looked like for newborns before the Apgar score was adapted and how small the knowledge about newborns health was. This information has gone into the before segment of our project.

Hub Staff. "Virginia Apgar, a Leading Advocate for Neonatal Health." *Hub*, John Hopkins University, 28 Mar. 2018, hub.jhu.edu/2018/03/28/virginia-apgar-women-of-hopkins/. Accessed 11 Feb. 2023.

By viewing this website we were able to learn more about the steps Dr. Apgar took to finalize the Apgar score. This information has gone into the right-before section of our project.

"Inaccuracy of the Apgar Test." *National Library of Medicine*, pubmed.ncbi.nlm.nih.gov/3225661/. Accessed 1 Dec. 2022.

We used this website to determine the negatives of the Apgar Test and how different hospitals and doctors get different results on how accurate this test is. This information was used in our Short- Term impact.

"It Happened Here: The Apgar Score." *New-York Presbyterian*,

healthmatters.nyp.org/apgar-score/. Accessed 10 Dec. 2022.

This website informed us about how simple the Apgar test is but how hard this test was to create. When Virginia Apgar was first created it was supposed to help physicians and nurses to assess a newborn in a quick way. This was used in our build-up/right-before section.

Li, Fei, et al. "The Apgar Score and Infant Mortality." Edited by Yan Gong. *Plos One*,

edited by Yan Gong, National Library of Medicine, 29 July 2013,

www.ncbi.nlm.nih.gov/pmc/articles/PMC3726736/. Accessed 1 Jan. 2023.

By reading this article we gained more information about the doubts towards the Apgar score's usage, and how people believed that it was not accurate and would miss some important diagnoses. This material has gone into the long-term impact of our project.

***Life in the Fast Lane*. litfl.com/apgar-score/. Accessed 11 Jan. 2023.**

This website shows us a picture of the Apgar chart, and how it works. We can use this to help us explain how it works and it has gone into the heart of the story section.

Macrotrends. "U.S. Infant Mortality Rate 1950-2023." *Macrotrends*, edited by

Macrotrends,

www.macrotrends.net/countries/USA/united-states/infant-mortality-rate. Accessed 3 Feb. 2023.

We used this website to get detailed statistics on the infant mortality rate from 1950 to 2023. This information has gone into our short-term and long-term impact, and you can see the graph on our exhibit board.

Miles, Karen. "The Apgar Score." *Baby Center*, edited by Jennifer Shu,

www.babycenter.com/baby/newborn-baby/the-apgar-score_3074. Accessed 1 Dec. 2022.

By reading this article we were able to have a better understanding of what the Apgar test looks like now and how it has changed over the years. This will go into the long-term impact part of our project.

Nair, M.D., Abhijit, et al. "The Reliability of Surgical Apgar Score in Predicting Immediate and Late Postoperative Morbidity and Mortality: A Narrative Review." *Rambam Maimonides Medical Journals*, National Library of Medicine, 29 Jan. 2018, www.ncbi.nlm.nih.gov/pmc/articles/PMC5796735/#:~:text=THE%20SURGICAL%20APGAR%20SCORE,-Gawande%20et%20al&text=This%2010%2Dpoint%20score%20is,the%20end%20of%2030%20days. Accessed 10 May 2023.

When reading through this website we were given more information on what the Surgical Apgar score is and how the Apgar score inspired it. This information has gone into the short-term impact section of our project.

National Library of Medicine. "Virginia Apgar the Virginia Apgar Papers." *National Library of Medicine*, edited by National Library of Medicine, profiles.nlm.nih.gov/spotlight/cp/feature/biographical-overview. Accessed 3 Nov. 2022.

We used this article to get a better understanding of what Virginia's life was before she went into medicine and what got Virginia into studying anesthesiology. This has gone into the before of our project.

National Library of Medicine.

profiles.nlm.nih.gov/spotlight/cp/feature/biographical-overview.

This website provides us with a picture of Virginia Apgar tending to a newborn. This photo can be seen in our exhibit.

"National Vital Statistics." *CDC*, www.cdc.gov/nchs/data/nvsr/nvsr56/nvsr56_10.pdf. Accessed 25 Jan. 2023.

We used this website to find the percentages of neonatal stillborn deaths in 1940 and how they decreased to the current time. This information was used in the Long-Before section.

***National Women's Hall of Fame.* www.womenofthehall.org/inductee/virginia-apgar/. Accessed 9 Dec. 2022.**

This website teaches us about Virginia Apgar and why she thought it would be a good idea to study medical things about babies before leading up to the discovery of the Apgar score.

NCLEX Review. "APGAR Newborn Assessment NCLEX Review." *RegisteredNurseRN*, edited by RegisteredNurseRN, RegisteredNurseRN.com, www.registerednursern.com/apgar-newborn-assessment-nclex-review/. Accessed 3 Feb. 2023.

By viewing this website we learned how the Apgar score is still taught and established in the curriculum for medical students. This information has gone into the long-term impact section of our project.

Pace, Eric. "L. Stanley James Is Dead at 69: A Pioneer of Neonatal Medicine." *The New York Times*, New York Times, 7 Aug. 1994, www.nytimes.com/1994/08/07/obituaries/l-stanley-james-is-dead-at-69-a-pioneer-of-neonatal-medicine.html#:~:text=James%20conducted%20research%20with%20Dr,Kienast%20of%20Liberty%20Corner%2C%20NJ. Accessed 9 Jan. 2023.

By reading this article we were able to dive deeper into who Stanley James was and how he helped Virginia Apgar create the Apgar score with his knowledge on fetuses and newborns. This information has gone into the before segment of our project.

The People's History. "The List of 1952 Major News Events in History." *The People History*, edited by The People History, People History, www.thepeoplehistory.com/1952.html. Accessed 20 Dec. 2022.

We have used this website to learn more about what was going on in the world of medicine while Virginia was creating the Apgar score. This has gone into the build-up section of our project.

Reggev, Kate. "Born within These Walls: The Lying-In Hospital." *Madame Architect*, Square Space, 29 Nov. 2021, www.madamearchitect.org/in-ink/2021/11/29/born-within-these-walls-the-lying-in-hospital. Accessed 12 May 2023.

By reading through this article we were not only given information on the birthing process in the late 19th century and early 20th century, but were also provided with many photographs showing the rooms that women would have to stay in and before and after birth. It helped us get a better understanding of what the birthing process really was. This information has gone into the long-before section of our project.

Reynolds, Leda. "Medieval Fire Rituals, Tudor Birthing Chairs, Smoking to Relax and Drinking Guinness to Increase Mums' iron: The Evolution of Childbirth Revealed." *Daily Mail*, MailOnline, 25 Mar. 2015, www.dailymail.co.uk/femail/article-3002834/Medieval-fire-rituals-Tudor-birthing-ch

airs-smoking-relax-drinking-Guinness-increase-mums-iron-evolution-childbirth-revealed.html. Accessed 9 May 2023.

By reading this article we were informed about more ways women went through their pregnancy and different precautions in the early 20th century. This information has gone into the long-before section of our project.

Simon, Leslie V., et al. "Apgar Score." *National Library of Medicine, StatPearls*, 18 Aug. 2022, www.ncbi.nlm.nih.gov/books/NBK470569/. Accessed 5 Dec. 2022.

The information from this website was useful because it helped us understand the long-term impact of the Apgar Score and how many newborns' lives it has saved. This information has gone into the long-term impact of our project.

STAT.

www.statnews.com/2022/07/12/apgar-scores-less-predictive-of-infant-mortality-for-black-babies/. Accessed 18 Nov. 2022.

This website tells us a lot of negatives about the Apgar test including how it can be commonly seen as inaccurate towards babies of color. We have used this in the short-term impact section of our project.

10 Facts About Virginia Apgar.

www.ecoparent.ca/eco-parenting/10-facts-about-dr-virginia-apgar. Accessed 16 Jan. 2023.

This website gave us more basic information about Virginia Apgar. This information has gone into the heart of the story section in our project.

***United Nations.* www.un.org/en/. Accessed 23 Jan. 2023.**

By viewing this graph it visually showed how beneficial the Apgar score is. This information has gone into the long-after section of our project, and you can see the graph on our board.

"U.S. Infant Mortality Rate." *Macro Trends*,

www.macrotrends.net/countries/USA/united-states/infant-mortality-rate. Accessed 31 Jan. 2023. Chart.

We used this website to find statistics of infant mortality throughout the Apgar Test, from when it was made to current mortality. This information was used in the long-term impact and short-term impact sections.

"Virginia Apgar demonstrating the Apgar score." *Compass*,

compass.fivecolleges.edu/object/mtholyoke:26745. Accessed 10 Jan. 2023.

We used this website for many photos that show Virginia Apgar performing the Apgar Test on newborns. These photos were put in the heart of the story and the short-term impact.

"Virginia Apgar—the Apgar Score." *Mayo Clinic*,

[www.mayoclinicproceedings.org/article/S0025-6196\(11\)63922-0/fulltext#relatedArticles](http://www.mayoclinicproceedings.org/article/S0025-6196(11)63922-0/fulltext#relatedArticles). Accessed 4 Nov. 2022.

We used this website to prove that the Apgar Test Virginia Apgar made is still used today. This information was used in our Long-Term Impact because of how long-term effect it still has today.

"Virginia Apgar: The Apgar Score | Heroes of Progress | Ep. 22." *Youtube*, uploaded by

Human Progress, 26 Apr. 2021, www.youtube.com/watch?v=7ZgaMHrlis. Accessed 1 Jan. 2023.

By viewing this video it has helped us gain additional information of what was happening with the mortality rate. The infant mortality rate was declining from the 1930's to the 1950's Virginia noticed that the death rate after the first 24 hours continued to stay the same. This information has gone into the right before section of our project.

Vitalis. "Virginia Apgar." *Vitalis Health*, edited by Vitalis Health Private GP, 13 Mar. 2022,

vitalishealth.co.uk/medical-blog/63ih6ggk4fbkowzcybyrx064zkptn62022/3/2. Accessed 25 Jan. 2023.

By viewing this website we learned more about how the Apgar score is performed. This will go into the heart of the story section of our project.

West, Kelly. "Revealing Data: Reflections on the Apgar Score." *Circulating Now*, National Library of Medicine, 9 Mar. 2023, circulatingnow.nlm.nih.gov/2023/03/09/revealing-data-reflections-on-the-apgar-score/. Accessed 10 May 2023.

By reading this article we were able to receive a perspective of someone whose life was saved because of the Apgar score. When Kelly West was born her mother was on the verge of death and Kelly was severely premature. The physicians were able to focus on her mother while someone else was able to quickly evaluate Kelly by using the Apgar score which ultimately saved her life. This information has gone into the long-term impact section of our project.

***What Is the Apgar Score?* www.whattoexpect.com/first-year/your-baby-s-apgar-tests.aspx. Accessed 9 Dec. 2022.**

This website teaches us about the newborn's first checkup and how the Apgar score comes into play. This has gone into the short-term and long-term impact.

"What Is the Apgar Score?" *Youtube*, uploaded by Medical Centric, 12 Jan. 2019, www.youtube.com/watch?v=O1RubKDvXj4. Accessed 2 Jan. 2023.

By viewing this video it taught us more about why they do two tests one a minute after birth and another five minutes after birth, and how those two scores show the doctors two different things and how they need the further care for the newborn. This information has gone into the heart of our story.

Yeung, Jessie. "Virginia Apgar's Test Has Saved Millions of Babies; Google Doodle Says Thank You." *CNN Health*, CNN, 7 June 2018, www.cnn.com/2018/06/07/health/virginia-apgar-intl/index.html. Accessed 11 Jan. 2023.

By reading through this website we were able to gain more information on how the Apgar test could tell the mortality rate of a newborn by their Apgar test score. This information has gone into the heart of the story section in our project.