

Credits

This exhibition was organized by the *Designing Motherhood* curatorial team in collaboration with the MassArt Art Museum.

In Boston, the project's thought partner is Neighborhood Birth Center (NBC) which will open as Boston's first independent and freestanding birth center in 2023 with the vision of improving birth experiences and outcomes, across communities, for generations.

In Philadelphia, the project's thought partner is Maternity Care Coalition (MCC), who ensure families can birth with dignity, parent with autonomy, and raise babies who are healthy, growing, and thriving.

The Mütter Museum, the Center for Architecture and Design, and the University of Pennsylvania School of Design, all in Philadelphia, were vital to the development of the *Designing Motherhood* exhibition.

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Introduction

Birth is the way we all arrive in this world. And each of us have, or will at some stage in the future, repeat, prevent, rethink, or reject that process of reproduction. As we do, we'll interact with designs of all kinds—tools, techniques, systems, and customs—to make and break these cycles.

Design impacts each step in the arc of human reproduction, from the menstrual cup that can be used time and again to collect monthly menses and maternity wear that allows its user flexibility to systems of care that encourage autonomy and development for both babies and adults.

But who shapes these designs? Some of the objects and systems you'll encounter in this exhibition are the product of industrialized medicine, like the Kuddle-Up baby blanket, while others have been shaped by dire need and collective political will, like the low-cost foot-pump abortion kit. Still others have been conceived by activist designers frustrated at the lack of innovation in designs for reproductive health, such as twenty-first-century pregnancy tests that are biodegradable and flushable, or that are tactile rather than based on sight cues.

While being born is a universal human experience, the designs that shape it are not. Many remain taboo, rarely considered, and inaccessible to many. *Designing Motherhood* invites you to consider why and how we have developed designs to facilitate reproductive health, and to ponder the political, economic, and social implications of how we medicalize reproduction. These are not just women's issues. They are human issues. They matter to us all.

(on monitor)

0.1 *Maternity Care Coalition Narratives, 2021-2022*

Directed by Zoë Greggs and Gabriella Nelson

Storytellers in Episode 1: Julia Lewis, Karen Pollack, Gabriella Nelson

Storytellers in Episode 2: Adrienne Edwards, Tekara Gainey

Images from the Maternity Care Coalition archives held at the University of Pennsylvania Kislak Library; and other licensed images

Edited by Austin Fisher

Music by Austin Fisher

Research by Romy St. Hilaire

Rights to these stories are held by the storytellers themselves

Since 1980, Maternity Care Coalition (MCC) has served 140,000 families throughout southeastern Pennsylvania, focusing particularly on neighborhoods with high rates of poverty, infant mortality, health disparities, and changing immigration patterns. MCC's activities include their signature MOMobile program, which enables home visits to new parents, as well as training community members to become doulas and to provide lactation support in a culturally responsive way. Their vision is an equitable future in which all families are healthy and connected, and all children are thriving and ready to learn.

The storytellers are direct service staff at MCC and they shared their experiences as a way to highlight labor that often goes unseen and underpaid. Each storyteller was in control of how their narrative was presented here. When you listen to their experiences, consider your own relationship to what they shared, how you value their labor, and how you participate in the social systems that determine how we care for those who do care work.

We invite you to watch, and then act: talk about the value of care work in public, with your family, and with your elected representatives (especially if you are a carer, because people need to hear your stories!). Bringing care work to greater attention will hopefully help shift the needle towards (much) better support for care workers.

(on monitor)

0.2 *You Were Welcomed With Love, 2022*

Created by the Neighborhood Birth Center, Boston

Art by Molly Crabapple

Narrated by Jade Guerra and Noël Samuel

Written by Jessie Laurore

Directed by Jim Batt and Kim Boekbinder

Produced by Sharp as Knives and Susan Lombardi-Verticelli

Neighborhood Birth Center's mission is to offer comprehensive midwifery care in a setting rooted in relationships and community. Boston's first birth center, this Black and Brown-led non-profit, will be staffed by licensed midwives and offer luxurious maternity care in a community-based healing sanctuary. It will also be co-located with other social justice and wellness organizations, allowing for shared spaces, services, and resources. This animated film tells part of NBC's origin story and illustrates a vision for the future of birth in Boston.

Look up the work of these amazing organizations and spread the word about what they do to design the cities they serve:



1. Exam

Design is never a neutral endeavor. While designers have given us methods to monitor our bodies, and tools for safeguarding gestation and birth, some of the instruments of examination in this section were developed through procedures now understood as torturous and predicated on lack of autonomy or absence of consent. The tools here—like all objects—have moral and ethical dimensions. Today, the designers of the Yona Speculum and midwives like Chicago-based Stephanie Tillman educate about and advocate for consent in pelvic care, and engage with design in new ways. Instead of designing examination protocols to only serve practitioners, new generations of tools and practices are designed from the perspective of the patient. This enables the pelvic exam to embrace trans- and trauma-informed care practices, and to consider the many different experiences people bring with them to medical settings.

Susan Ferreyra (American, b. 20th century)
Katrine Hughes (American, b. 20th century)
Anne Walzer (American, b. 20th century)
Planned Parenthood of San Francisco
1.1 *Table Manners: A Guide to the Pelvic Examination for Disabled Women and Health Care Providers, 1982*
Courtesy of Planned Parenthood

Written by two people who self-identify as “physically disabled women with experience in the fields of family planning, education and counseling,” *Table Manners* is based on “the assumptions that disabled women are sexual, and that they deserve quality health care services which are accessible and sensitive to their needs.” These excerpted illustrations by Anne Walzer show how patients and providers might collaborate to make a pelvic examination as comfortable and empowered as possible for every person.

1.2 Pompeii Quatra-Valve Speculum, 19th century reproduction of c. CE 79 design
On loan from the Mütter Museum of the College of Physicians of Philadelphia

For centuries, the speculum—an early diagnostic instrument in medicine—remained the only tool to permit internal examination of the uterus via the

vaginal canal. This design requires the insertion of a three- or four-prong cluster into the vaginal canal, followed by the application of outward pressure to separate the prongs and stretch surrounding tissue, thus enlarging the opening and permitting inspection. Success with the speculum, from ancient times to the present, has required the patient to assume a particular posture. The use of the speculum has influenced perceptions of female anatomy. Governed by retrograde and patriarchal assumptions that were part of mainstream medicine at the time, most physicians (and some midwives) who used the speculum believed that female bodies were somehow incomplete or weaker versions of male ones. Up until the early twentieth century, physicians—predominantly male—believed that disturbances to the uterus changed women’s behavior, with “hysteria” becoming a code term for psychological problems erroneously perceived as being rooted in the uterus.

1.3 J. Marion Sims (American, 1813-1883)
Lucy (Sims) Speculum, c. mid 19th century
On loan from the Mütter Museum of the College of Physicians of Philadelphia

American physician J. Marion Sims (1813-1883) applied himself to what became known as the

medical specialty of gynecology. Among his innovations, he invented a method of repairing the fistula, a condition in which a hole develops in the birth canal between the vagina and rectum, ureter, or bladder as a result of childbirth. Sims used silver sutures and adapted a type of speculum still in use today. His earliest prototypes used a bent pewter spoon, with various postures to be assumed by his patients in order to see into the body and repair damage.

Although his work has improved women's health, his major successes owed to experimentation on enslaved African American women during the 1840s. The enslaved patients—some of whose names are known, including Betsey, Anarcha, and Lucy—endured many surgeries, mostly without anesthesia even after it became available. By virtue of their enslavement, they were incapable of consenting to these painful surgeries. In 2020, Manhattan-based obstetrician Kameelah Phillips decided to rename the speculum as “Lucy” for one of the women, “because I wasn’t going to give honor to a man who operated on the backs and developed instruments on the backs of women who looked like me.”

Fran Wang (American, b. 1990)

Rachel Hobart (American, b. 1991)

1.4 Yona Speculum Prototype, 2019
frog design (est. 1969, Germany;
headquartered in the US)
Aluminum and silicone
Courtesy of Yona Care

Today more than sixty million pelvic examinations with specula take place in the US annually. At the San Francisco design firm frog, four women—Rachel Hobart, Sahana Kumar, Hailey Stewart, and Fran Wang—investigated a range of specula and interviewed medical personnel and many stakeholders who expressed a wish for a new speculum design. The designers questioned why the speculum has not changed to better serve people with vaginas who, in the twenty-first century, have also used the instrument for self-examination. To develop the new instrument, which they have called Yona (from the Hindu *yoni*, or the life force symbolized by the vulva), the design team evaluated materials, efficiency, ergonomics, and even auditory phenomena. Yona features surgical-grade silicone in an attempt to eliminate the feel of cold steel and diminish the metallic sounds of specula. The redesign has also modified the angle of the handle to improve comfort. Ultimately, the designers behind Yona intend it to aid in shorter

pelvic exams with less stress and discomfort. For two millennia people with vaginas have had little voice in the design of tools that entered their bodies to assist their health. Now a new speculum has appeared that, as frog puts it, is designed “for people with vaginas by people with vaginas.”

1.5 Exam Table Stirrups, c. 1885
Canton Surgical and Dental Co., USA
On loan from the Mütter Museum of the
College of Physicians of Philadelphia

The lithotomy position, in which a person lies on their back with legs raised and bent at the knees, is commonly used in gynecology to open the pelvic region for examinations and surgical procedures. In the West, this is also the posture commonly employed in hospital births. Both rely on medical stirrups to support the feet. In her practice, Chicago-based midwife Stephanie Tillman, among an increasing number of health care providers, works to dispel the (often severe) discomfort many patients associate with this design. As Tillman says, “Many providers see stirrups or foot pedals as making their day easier because they keep everyone in the same position and facilitate getting to the cervix easily . . . But we can get to the cervix easily from many different positions. And in my experience, having people find their most comfortable position and working around that ultimately takes less time.”

Eden Laurin (American, b. 1983)
1.6 Nyssa VieVision Between Legs Self-Check
Mirror, 2021
Nyssa (est. 2018, US)
Plastic
Courtesy of Nyssa

Founded by three new mothers in 2018, Nyssa launched as a company with a focus on postpartum recovery. One of their first designs was a panty that incorporated an ice pack to soothe ravaged netherregions after giving birth. With the tagline “Get to know your vulva in a whole new light,” their hands-free mirror is shaped so that it sits between the thighs in a seated or standing position. An LED light offers a clear and unrestricted view of the user's vulva and vagina which Nyssa's founders suggest can be used for routine wellbeing checks, self-grooming, or to guide the insertion of a tampon, cup or contraceptive device.

2. Means of Reproduction

Tools to monitor reproduction and control fertility have been conceived by activists as well as medical professionals and designers. Social movements have been key to shifting legal and social restrictions, as well as ensuring duties of care, around designs for reproductive health. In 1997, sixteen women-of-color-led organizations representing four communities of color—Native American, Latin American, African American, and Asian American—launched the US nonprofit SisterSong, which has become the foundation for a national Reproductive Justice movement. This movement defines Reproductive Justice as “the human right to maintain personal bodily autonomy, have children, not have children, and parent the children we have in safe and sustainable communities.”

(on monitor)

- 2.1 **Kyuri Jeon (South Korean, b. 1990)**
다신, 태어나, 다시 Born, Unborn and Born Again, 2020
Single HD Video, Sound
12 mins and 23 secs
Proofreading by Em Rea, Min Baek
Sound by Michael Bailey
Supported by The Sachs Program for Arts Innovation
Distribution by Cinema Dal
Courtesy of the artist

Kyuri Jeon’s video, *Born, Unborn and Born Again*, opens with the artist attending a 2019 public celebration of the repeal of abortion restrictions in Seoul, South Korea. Her affirmation of this milestone of reproductive justice is quickly complicated by her ensuing exploration of her own gestation thirty years ago which, in a culture that prizes male babies, was carried to term because an ultrasound misassigned her gender. Made in the US, a country with more—and increasingly restrictive—abortion laws than the country in which she was born, Jeon’s film explores the transnational nature of governmental control over reproductive systems, switching between Korean and English as a way to signal ruptures and repetitions of time.

- 2.2 **Herbert Bayer (American, born Austria, active Germany and US, 1900-1985)**
The Menstrual Cycle Brochure, 1939
Schering AG, 1851
Original: Offset lithograph on paper, mounted on black paper
Courtesy of Cooper-Hewitt, Smithsonian Design Museum and the Artists Rights Society

In 1939, Herbert Bayer, a promising young Austrian-born designer, tried his hand at envisioning the menstrual cycle after receiving a commission by the pharmaceutical company Schering AG, which had just developed Progynon-B and Progynon-DH, new forms of estrogen, good for “correcting menstrual disturbances.” In his wider practice, Bayer loved incorporating colorful illustrations within his photomontage—splicing and reassembling photographs and adding gouache to make new kinds of graphic compositions. Bayer’s brochure, “The Menstrual Cycle,” is full of anatomical detail as well as cosmic reverence. The black background evokes a night sky, and a uterus at the center of the image appears to radiate out into the universe. Bordered by phases of the moon, an ova circles the page, its satellite journey proceeding from ovary to fallopian tube to uterus and beyond. In this idealized view, the uterus is in perfect harmony with the cosmos.

2.3 *Two child policy, 2007*

**Produced by the India Ministry of Health and Family Welfare
Image courtesy of Alamy**

2.4 *Would you be more careful if it was you that got pregnant?, 1969*

**Photographed by Alan Brooking
Art Directed by Bill Atherton
Copywritten by Jeremy Sinclair
Cramer Saatchi Advertising Agency (est. 1970, UK)
Poster for the Health Education Council,
issued by the Family Planning Association, UK**

2.5 *Jihua shengyu haochu duo/Family planning has many advantages, 1974*

Originally distributed in the People's Republic of China; reprinted for this exhibition courtesy of International Institute of Social History, Amsterdam

Policies designed to control population growth, whether by contracting or expanding birth rates, have long existed. This includes policies for mass sterilization in the US, where legislation effectively dressed up eugenics in economic terms. In 1952, India was the first country in the world to launch a mass media campaign to spread the concept of family planning in response to population growth. Most developing nations soon followed suit. In the twentieth century one country became the poster child—literally and figuratively—for these programs as a result of the visual propaganda it produced in pursuit of population control: the People's Republic of China. However, widespread concern over rising environmental issues and perceived overpopulation (which could often smack, at best, of diplomatic paternalism and, at worst, of eugenic fervor) led many governments to monitor their demographic booms and busts. This sentiment has not disappeared in the twenty-first century, though hand-wringing over declining birth rates has thus far failed to materialize improved policies for family leave, maternal and infant health, or fair compensation for caregiving.

Faith Maramba Mamaradlo (Filipina-American, b. 1999)

2.6 *Walang Hiya, 2020*

Courtesy of the designer

Walang Hiya is a speculative campaign that aims to promote sex education and reproductive health in the Philippines. It was developed by Filipina-

American designer Faith Maramba Mamaradlo as part of *Designing Motherhood's* curriculum intervention in fall 2020 at the Weitzman School of Design. In Tagalog, the phrase “walang hiya” typically translates to “have you no shame.” Mamaradlo subverts this translation and removes the negative connotation, instead understanding the phrase to mean “have no shame” when discussing sex education and reproductive health. According to the Philippines' national economic development agency, teen pregnancy is a national social emergency. The country's strong religious values and high poverty rate contribute to this crisis, alongside adverse reproductive health policy: until recently, the age of consent in the Philippines was 12, while the age to acquire contraceptives is 18.

As a Filipina-American designer, Mamaradlo is acutely aware of the stakes of her work. She writes, “*Walang Hiya* is a project that represents many of my identities: my heritage, my femininity, and my duty as a designer. I've seen how the lack of sexual education and antipathy toward women's health have affected my fellow Filipinas, in my personal life and beyond. This project is an ode to them, even if their own country cannot support them in reproductive rights and overall women's liberation.”

Deborah Willis (American, b. 1948)

2.7 *I Made Space for a Good Man, 2009*

**Lithograph, edition of 28
Printed at the Brandywine Workshop and Archives in Philadelphia
Courtesy of the artist**

This triptych by Deb Willis, a color lithograph shows the artist pregnant with her son, reclining in a wicker chair in the winter of 1975-76. Above and below the images, a script in white cursive modulates from “A woman taking space from a good man” to “I made a space for a good man.” In a 2010 interview with the Huffington Post about the piece, Dr. Willis recounted that when she was an undergraduate at the Philadelphia College of Art (now part of University of the Arts), one of her professors told her, “All you're going to do is get married, get pregnant, have a baby and a good man could have been in your seat.” Willis, a MacArthur fellow and now the chair of the Fine Arts program at New York University, said she never forgot the humiliation and embarrassment she felt in that moment. Her son, Hank Willis Thomas, is a celebrated artist in his own right.

3. Our Bodies Ourselves

The latest edition of *Our Bodies, Ourselves*, published in 2011 and more than nine hundred pages long, is a far cry from its originating documents—a Xeroxed sheaf of handwritten notes passed among women in Boston in 1969. Originally titled *Women and Their Bodies*, the text was collaboratively written by the Boston Women's Health Book Collective, a group of White middle-class women. That first text included an essay on the intersection of women, medicine, and capitalism and chapters on basic anatomy, sexuality, sexually-transmitted diseases, birth control (including abortion), pregnancy, childbirth, and postpartum care. First-person testimonials formed the core of the book, overriding predominantly male doctors to place trust in women's own embodied experiences. Like the book, the designs in this section speak to these embodied experiences and associated, often complicated topics centered on bodily autonomy.

JEB (Joan E. Biren) (American, b. 1944)

- 3.1 ***Dessie Woods (later Rashida Muhammad Mustafa) at a Take Back the Night March, Washington, DC, 1981***
- 3.2 ***The pro-choice march and rally Mobilize for Women's Lives/Women's Equality, Washington, DC, 1989***
- 3.3 ***Darquita with her mother, Denyeta, 1979***
- 3.4 ***Jan Dixon (later Jamilah Ali) and Barbara Lewis doing a cervical examination, 1979***

**Archival pigment prints
Courtesy of the artist**

JEB (Joan E. Biren) is an internationally known photographer and documentary filmmaker who has chronicled social justice movements and the lives of lesbians for more than four decades, making visible the often hidden histories of women and other marginalized people. Biren came out in the 1960s and realized the need for self-expression and affirming images of lesbian culture, beyond traditional and patriarchal visual

languages. In the 1970s, Biren toured the US, photographing lesbians at women's events like the Michigan Womyn's Music Festival, anti-Ku Klux Klan demonstrations, and gay and lesbian pride marches. Her ground-breaking images are intimate portraits of daily life and documents of the emerging women's health movement.

- 3.5 **Jess T. Dugan (American, b. 1986)
Self-portrait with Vanessa and Elinor (2 days old), 2018
Archival pigment print
Courtesy of the artist and Turner Carroll Gallery**

In 2011, the artist began an ongoing project photographing their family, making images of themselves, their partner Vanessa, eventually their daughter, Elinor, and the artist's mom and her partner. *Self-portrait with Vanessa and Elinor (2 days old)* was an unplanned addition to the series, made in the hospital when the new parents realized they had some quieter moments in the immediate postpartum period. Jess photographed their partner, Vanessa, holding

newborn Elinor, and wearing stretchy mesh underwear, commonly used in the days and weeks after giving birth, to hold large pads for postpartum bleeding (called *lochia*) as well as ice packs for swelling. Vanessa encouraged Jess to make a self-portrait, too, and it became a diptych. The portrait captures a moment when both were exhausted but elated, like many new parents. In Jess' words, "I'm interested in documenting my own family and also creating representations of queer and gender expansive families and butch/transmasculine parenting."

**3.6 Boston Women's Health Book Collective
Our Bodies, Ourselves, second edition, 1974
First published in Boston in 1970 as Women
and Their Bodies**

Originally titled *Women and Their Bodies*, the text was collaboratively written by a group of White middle-class women, the Boston Women's Health Book Collective. Developed for a community-organized class, which ran only once, it was Xeroxed and self-published for wider distribution in 1970 and cost seventy-five cents.

Handwritten in a neat cursive, the first table of contents listed the course outline—from an introductory essay on the intersection of women, medicine, and capitalism through chapters on basic anatomy, sexuality, and sexually-transmitted diseases, to birth control (including abortion), pregnancy, childbirth, and postpartum care. First-person testimonials formed the core of the book, overriding predominantly male doctors to place trust in women's own embodied experiences.

Today, it is the one of the most frequently translated (thirty-one languages and counting) and best-selling feminist books worldwide. A Spanish-language edition aimed primarily at a US audience was published in 1977 as *Nuestros Cuerpos, Nuestras Vidas*. Editions in other countries and cultural contexts grapple with a range of issues. In Egypt, after heated discussion, consensus was reached around the text on female circumcision, which, controversially to some readers, explained its cultural context and allowed its continuation.

**Suzanne Siemens (Canadian, b. 20th century)
Madeleine Shaw (Canadian, b. 1970)**

**3.7 Boxer Brief, 2020
Manufactured by Aisle (formerly Lunapads)
Tencel, organic cotton, spandex, recycled
polyester, organic cotton, polyester, TPU
laminate**

3.8 Rael Reuseable Pantiliner, 2021

In the last decade, many underwear products have emerged that utilize a patented combination of material layers in the seat of the garment. Users can thus do away with single-use sanitary pads or tampons, instead turning to designs that meet the needs of a wide spectrum of people who menstruate. Such garments are antimicrobial, leak resistant, and designed to look inconspicuous yet fashion-forward. Companies make their message one of inclusivity. But can product design make a positive difference without deep and systemic redesign of social frameworks?

**Leona Watson Chalmers (American, active
20th century)**

**Robert P. Oreck (American, active 20th
century)**

**3.9 Tassette, 1959
Rubber**

**Jane Hartman Adamé (American, b. 20th
century)**

Andy Miller (American, b. 20th century)

**3.10 FLEX Cup (originally Keela Cup), 2017
100% Medical grade silicone**

With early designs dating back to 1867, the modern menstrual cup—a flexible, bell-shaped device that folds easily for inserting into the vagina—was designed in several iterations. The midwifery group, McGlasson and Perkins, designed a "bullet-shaped" rubber prototype in 1932. The first commercially available cup was designed in 1935 by Leona Watson Chalmers, a former Broadway actress who cites her costumes of white silk as inspirations for the design. In 1959, Chalmers partnered with Robert Oreck to revive the idea, calling the product Tassette (*tasse* is "cup" in French, and the diminutive *-ette* was added to indicate "little cup").

Because cups last for about ten years, they are significantly more affordable and environmentally friendly than disposable alternatives. Nowadays, everyone from global

public-health researchers to large-scale companies, has championed the efficacy, comfort, affordability, and sustainability of menstrual cups, making them more accessible than ever before.

3.11 Tampax, 1936 **Manufactured by Tampax** **Cotton** **Courtesy of the Museum of Menstruation**

In the early 1920s, Kimberly-Clark's Kotex brand was born from technology invented during WWI. Nurses used Cellucotton, a cotton substitute used by the US Army to absorb blood, for their periods. Commercialized after the war (less with a feminist agenda than an entrepreneurial one aimed at selling the leftover product), this modest disposable item proved groundbreaking, providing hours of absorption for the user in tampon and pad form. In 1969, Kotex innovated again with the StayFree Mini Pad that adhered to the user's underwear, no longer needing to be held between the body and the panty with the aid of safety pins and belts. This apparently minor change in the pad was groundbreaking—and telling that it took the industry decades to figure out.

Certain brands have become near-universal due to canny design and marketing. Tampax, a compressed cotton tampon with a cardboard applicator tube invented by an American doctor named Earl Hass, was patented in 1933. The first to have a cardboard tube, the design created a distance between the finger and the vagina—a marketing tactic built on the mania for hygiene and discretion that has fueled dialogue (and dollars) connected to menstruation for decades since.

More recently, the safety of mass-produced tampons has been under scrutiny as common materials used in their making (polyester, polyacrylate, rayon, and viscose rayon) may provoke Toxic Shock Syndrome. The poorly regulated industry—opaque about its processes and often unconcerned for the health of users—has catalyzed a new generation of entrepreneurs who advocate for the health of menstruating people and the environment, and use organic materials in the production of their tampons.

3.12 David P. Wagner (American, b. 20th century) **DialPak Contraceptive Dispenser, c. 2001** **Plastic**

Illinois engineer David P. Wagner invented the DialPak when he and his wife had difficulty remembering whether she had taken her daily contraceptive pill. The principle is similar to many used today: four sets of seven days of the week, arranged in a round dial in this early iteration. Moving from housing the pills in a jar, the design made it easier to note whether a pill has been ingested, offering greater agency and precision over contraception.

3.13 YouScreen Self-Sample Kit, 2021 **North Central and East London Cancer Alliance** **NHS England London Region and Public Health England**

YouScreen is a research study supported by the UK's National Health Service (NHS) that is offering 31,000 people with cervixes in north and east London the opportunity to take a "do-it-at-home" self-sample to check for human papillomavirus (HPV), the virus known to be the primary cause of cervical cancer. The swabbing involves using a long, thin cotton bud to take a sample from inside the vagina, which is then sent by mail for testing. While self-sample kits are available for purchase around the world, the UK is only the third country (after Australia and Denmark) to distribute as part of the government's health services.

Dr. Anita Lim, from King's College London, who is leading the YouScreen trial, said: "Self-sampling is a game-changer... it is crucial that we find ways like this to make screening easier and protect women from what is a largely preventable cancer."

3.14 Omniflex Diaphragm (size 75), 2021 **Manufactured by Cooper Surgical (est. 1990,** **The Netherlands)** **Silicone, reusable plastic container**

Diaphragms have been around nearly as long as sex has. In ancient times, people inserted items like leaves and lemons into the vagina, but the first recognizable diaphragm was developed in the 1880s by German gynecologist Wilhelm Mensing. Mensing published the first description of a rubber contraceptive device with a spring molded into the rim that was sold as an effective barrier method of birth control. Birth control activist (and eugenicist) Margaret Sanger learned

about the diaphragm in the 1910s and illegally imported large quantities of diaphragms from Germany and the Netherlands.

The diaphragm became one of the most widely used contraceptives in the US in the twentieth century. According to Planned Parenthood, they are 94 percent effective when used correctly every time. In 1940, one-third of all American couples used a diaphragm for contraception. That number dropped dramatically after the 1960s introduction of the IUD and the pill. Today, most public health professionals perceive the diaphragm as having low acceptability. Yet, the diaphragm remains an important contraceptive option for people who can't or don't want to use hormones or Intrauterine Devices (IUDs).

3.15 Protest Buttons, c. 1960s-1990s

Social justice buttons have been popular as a way to advertise individual or collective demands, desires, and beliefs since the pin-back button was first invented at the turn of the twentieth century. Take for example, the image of a wire coat hanger emblazoned on a button. In the 1960s and '70s, as Americans argued over legalizing abortion, supporters of abortion rights sometimes held coat hangers aloft as an eloquent, grisly reminder that desperate women used them—and other methods—for horrific, sometimes fatal self-induced abortions.

Los Angeles Self-Help Clinic

3.16 Del Em Device, 1971

Glass jar, valved syringe, plastic cannula

Designed with readily available components, the Del Em device is used to perform abortions in the early weeks of pregnancy. The design emerged from a consciousness-raising meeting of the Los Angeles-based Self-Help Clinic that was co-led by feminist lawyer Carol Downer at the Everywoman's Bookstore in Venice Beach on April 7, 1971. Once the tube is fed through the cervix and into the uterus using a speculum, the syringe plunger is extended to create a vacuum, which extracts the contents of the uterus through the cannula into the jar. Lorraine Rothman, a teacher and mother of four, made the crucial addition of a valve to prevent air from being accidentally pushed back into the uterus, where it could then enter the bloodstream and cause

a fatal embolism. A mirror held by the person undergoing the procedure enables them to guide the process.

The design built on existing technologies of vacuum aspiration. The human reproductive scientist Malcolm Potts dates the first manual vacuum aspiration to the Scottish gynecologist James Young Simpson (1811-1870), who attended, among others, Queen Victoria. British consultant obstetrician and gynecologist Dorothea Kerslake produced a teaching film, *Pregnancy Termination by Vacuum Aspiration*, in 1966. Designed in direct response to federal and state restrictions on abortion, the Del Em is part of a long history of the collective struggle over control of the uterus. Potts pointed to this contested history when he remarked, "Only in a field as controversial as abortion would the same idea need to be discovered three times, each independently."

3.17 Manual Vacuum Aspiration Foot Pump, c. 1960

Metal, plastics

Courtesy of Ipas (International Project Assistance Services)

This foot-pump-activated manual vacuum aspiration (MVA) is used to perform abortions in the early weeks of pregnancy. Once the tube is fed through the cervix and into the uterus, the foot pump is activated to create a vacuum, which extracts the contents of the uterus into the jar. This twentieth century foot-pump for use by medical providers and its cousin, the at-home Del Em, are part of a long history of the collective struggle over control of the uterus.

IUDs

(left to right):

3.18 Birnberg Bow IUD

3.19 Unidentified 375 Copper Coil IUD

3.20 Margulies Spiral IUD

3.21 Hall-Stone Type Ring IUD: Uterine Shaped

3.22 Lippes Loop IUD

3.23 Majzlin Spring IUD

3.24 Saf-T-Coil IUD**3.25 Cushion Shaped Disc ICD (Intracervical Device) in 14 Karat Gold****3.26 Unidentified Silver IUD Paragard Copper IUD****3.27 Mirena IUD****3.28 Dalkon Shield IUD****On loan from the Mütter Museum of the College of Physicians of Philadelphia**

Small, variously shaped, and usually made of polyethylene or copper, intrauterine devices (or IUDs) are inserted in the uterus by a medical professional to prevent the process of insemination and implantation of an egg. They offer a reliable method of contraception. Today, their design is regulated in great part because of one particular IUD, the Dalkon Shield (furthest to the right in the vitrine). Administered to around 2.5 million women in the United States and Puerto Rico in the early 1970s before it was discontinued, its wick allowed bacteria to enter the uterus, causing widespread pelvic inflammatory disease and subsequent infertility. Loretta J. Ross, a pioneer of the Reproductive Justice movement, has tirelessly shared her own story of having the Dalkon Shield implanted, with disastrous consequences, in the 1970s in order to prevent future generations suffering as she did:

The design flaw was the wick... caused an infection that caused me to lapse into a coma, and I underwent a total hysterectomy at the age of twenty-three. It ended my fertility prematurely. By age twenty-five I was experiencing menopausal symptoms... I wasn't able to give permission for the hysterectomy; there was no informed consent... I did not wake up until the doctor who had performed my hysterectomy—who was the head of OB/GYN services at The George Washington University Hospital Center [in Washington, D.C.]—was standing by my bedside... He was the same doctor who for six months had been misdiagnosing my symptoms... as a venereal disease, or what we call an STD today. He didn't remove the Dalkon Shield until my fallopian tubes erupted.

Ellen Peck (American, 1942-1995)**William Granzig (American, b. 1939)****3.29 *The Baby Trap: A Devastating Attack on the Motherhood Myth*, 1971****Shirley Radl (American, 20th century)****3.30 *Mother's Day Is Over*, 1973****Ellen Peck (American, 1942-1995)****Judith Senderowitz (American, 20th century)****3.31 *Pronatalism: The Myth of Mom & Apple Pie*, 1974**

“Obituary: Motherhood” was the deliberately direct—and consequently incendiary—headline of Ellen Peck’s 1972 op-ed in the New York Times. She pointed a finger at rising awareness of environmental catastrophe and patriarchal social attitudes as reasons to remain—in a term coined in that moment—“child-free.” A year earlier, along with the sexologist William Granzig, Peck wrote *The Baby Trap*, one of the first books about the emerging child-free movement. She went on to found the National Organization for Non-Parents, an advocacy organization for people who choose not to have children. (Later known as the National Alliance for Optional Parenthood, it dissolved in the early 1980s.) Her partner in this venture was Shirley Radl, a writer and mother whose own provocative tome, *Mother's Day Is Over* (1973), featured on its front cover a diaper pin bent beyond repair.

The term “child-free”—as opposed to “childless,” which implies a thwarted desire to procreate—was (and still is) often followed by the qualifier “by choice” or “by circumstance.” It is crucial to note that the choice or circumstance of childbearing and child-rearing has often been violently withheld. The foundational literature of the child-free movement makes no reference to the racialized historical experiences of enslaved people whose children were considered not their own to raise and tend but the property of others, or to generations of women, predominately of color, who were sterilized without their consent and consequently unable to conceive. Whether child-free or not, it is the right to shape reproductive destiny that reimagines social power relations not as inevitable inheritance but as paradigms ripe for resistance and rethinking.

Bethany Edwards (American, active 21st century)

Anna Couturier Simpson (American, active 21st century)

3.32 LIA, 2018

Courtesy of the designers

LIA Diagnostics Inc. is rethinking the home pregnancy test as a plastic-free and -discreet experience that can be flushed away shortly after use, reducing the impact on the environment and increasing privacy. The company name is a play on the scientific term lateral immunoassay, a type of rapidly readable fiber test strip integral to a pregnancy test. The designers developed a biodegradable paper—lighter than six sheets of two-ply toilet paper—that remains durable when in contact with urine, yet breaks down almost immediately when flushed. Since Margaret Crane’s original design in the late 1960s, the form and aesthetics of pregnancy tests have rarely received innovative attention, a common story in women’s reproductive health. Today, young designers are increasingly focused on this field, challenging both social taboos and the historically gendered nature of the design world.

Josh Wasserman (British, active 21st century)
Royal National Institute of Blind People, UK

3.33 Tactile Pregnancy Test prototype, 2020

Courtesy of the designer

Blind or visually impaired people taking a pregnancy test almost always have to rely on others—sighted partners, friends, health-care workers, or strangers—to tell them their results, which can feel intrusive, belittling, and uncomfortable. This new pregnancy test developed by the Royal National Institute of Blind People (RNIBP) attempts to address this issue. Created by Josh Wasserman, an independent designer, the prototype is larger than the conventional urine-stick test and features bright yellow and pink panels so people with low vision can differentiate the top from the bottom. It works with the same existing technology sensors but relays information through tactile bumps. A small bump on the underside of the stick confirms that the urine has been absorbed by the pad and a separate set of bumps on the stick’s top side raises to indicate a positive result. In its accessibility to all users, not just those with sight loss, it is an example of universal design.

The Reproductive Justice Action Collective (ReJAC)

3.34 Plan B Nola Reproductive Health Zine, 2017
Courtesy of ReJAC

Plan B NOLA is a project of The Reproductive Justice Action Collective (ReJAC), which offers free or by-donation emergency contraception (or EC, a method of preventing pregnancy soon after unprotected sex) and accurate reproductive health information through the Community Support Members network in the greater New Orleans area. They are not health-care providers, but rather community members who want to increase access to this crucial and time-sensitive medication.

ReJAC created the Plan B Nola Reproductive Health Zine in summer 2017 with information about emergency contraception, sex education, birth control, and a listing of health resources available online and in the greater New Orleans area. It is available at public libraries, community outposts, in Plan B Nola packets, and from other New Orleans partners. ReJAC recognizes that many barriers prevent people from obtaining emergency contraception, including cost (Plan B can range from \$42 to \$60 at drugstores), inaccessibility, and stigma. Louisiana also has a government-sponsored “Conscience Clause” law, which allows individual pharmacists to legally refuse EC if it does not comply with their religious beliefs.

4. Parturition

Parturition is the process of delivering a fetus and placenta from the uterus to the outside world. Whether this process is vaginal, by Cesarean, at home, in a hospital, in a pool, or with an analgesic IV drip, it is surrounded by designs that shift dramatically depending on culture, politics, and economic situation. The designs shown here span centuries. Some were invented so that a medical professional could remove a living baby from a birthing person's body. Others speak to the metamorphosis that occurs when a baby emerges and so, too, does a new identity of the birthing person. These designs explore small elements of the wide spectrum of birthing experience which are increasingly being oriented to the needs, comfort, and agency of birthing people and infants rather than just their survival or the ease of use of the medical provider.

- 4.1 MyAnchor Birthing Pool Straps, first designed 2005**
Manufactured by Birth Pool in a Box Eco (est. 2003, US)
Foam and woven plastic

- 4.2 Birthing Stool, 2020**
Manufactured in the US
Poplar wood

Birthing furniture and other physical objects, such as chairs and backless stools, have balanced and supported laboring people for centuries across cultures, ethnicities, and geographic regions. An Egyptian wall relief, dated 1450 CE, depicts the stool that held Queen Mutemwia during the birth of her son, Amenhotep III. The body's position on the stool utilizes gravity as the newborn drops from the womb and emerges through the vaginal canal. Additionally the structure assists the birthing person maximize their abdominal, back, stomach, legs, arm, and vaginal sphincter muscles.

An ancient practice, water birth, can also allow freer movement during labor. Popular media representations of at-home water births typically portray a bright blue inflatable pool with three tubular chambers, but children's inflatable pools or even bathtubs also work! The birthing strap—two long black interwoven straps with foam handles, connected by a short horizontal band to make an H-shape—attaches to the external handles of the pool or tub to help its user comfortably shift and strain.

- Kim Jarrelle, BS, RNC-OB (American, active 21st century)**
Debbie Burbic, RN (American, active 21st century)
Jessamine O. Niccoli, RN (American, active 21st century)

- 4.3 Immediate Skin to Skin C-section Drape, 2015**
Clever Medical (est. 2015, US)
Non-woven synthetics
Courtesy of Clever Medical

An ancient surgical procedure (documented in 100 BCE as the way Gaius Julius Caesar entered the world), Cesarean section births are now the most commonly performed surgery the world over. However, surgical protective coverings, such as drapes and curtains, did not exist until well into the nineteenth century.

The Immediate Skin to Skin C-section Drape was developed by three nurses in Virginia in 2015 to allow the obstetrician to pass the infant to their birthing parent immediately after surgery through a square-shaped portal in the curtain. The newborn is then able to lay directly on their parent's chest for skin to skin contact (this promotes positive infant development and mediates the neonatal stress response) while ensuring a sterile medical environment.

**4.4 First Epidural Designed by James Leonard Corning (American, 1855-1923)
PERIFIX Filter Continuous Epidural Set
Manufactured by B. Braun Medical Inc. (est. 1839, Germany)**

In 1885, American neurologist James Leonard Corning injected 111mg of cocaine into the spine of a male volunteer, the first epidural test ever performed. In the early twentieth century, Spanish military surgeon Fidel Pagés (1886-1923) explored the technique to treat wounded soldiers fresh from the battlefield.

Reports today reflect that anywhere between 60 and 70 percent of births in the US involve the use of an epidural. Applied by an anesthetist who uses a needle to introduce an infinitesimally thin plastic catheter into the spine, an epidural works to block the nerves that send pain messages to the brain during birth. Many people describe a significant decrease in pain and a numbness in the legs, preventing lower movement and requiring the birthing person to wear a catheter for urination. No one approach to pain during birth is best, and none are universally available to all laboring people.

**Dr. Bernhardt Kronig (German, active 1850s)
Dr. Karl Gauss (German, active 1850s)**

4.5 Twilight Sleep advertisement

In 1906, German obstetricians Bernhardt Kronig and Karl Gauss presented their research findings on a birthing method, titled Twilight Sleep, at the Berlin National Obstetrics Conference. Touted to the elite as a “painless labor” alternative, the Twilight Sleep method involved injecting the laboring person with morphine at the start of birth pains and then doses of scopolamine, an amnesiac with hallucinogenic effects. Upon the emergence of the baby’s head, chloroform might be administered. The powerful drug combination was designed to completely erase the memory of labor pains but was not always effective.

In 1914, Dr. Elizabeth Taylor Ransom established a maternity hospital in Boston’s Back Bay and proudly and publicly championed the technique. However, patient Frances Carmody, a major advocate of Twilight Sleep, died while in labor with her third child during its use in 1915. Though the horrific national news coverage slightly lessened its popularity, Twilight Sleep was utilized for countless births well into the late 1960s.

**4.6 *The Lamaze Method: Techniques for Childbirth Preparation*, 1983
Produced by Embassy Home Entertainment, 1982**

(see Reading Area)

Fernand Lamaze (French, 1891-1957)

4.7 *Painless Childbirth: The Lamaze Method*, 1979

Michelle LeClaire O’Neil, PhD, RN (American, active 21st century)

4.8 *Creative Childbirth: The LeClaire Method of Easy Birthing Through Hypnosis*, 1991

French obstetrician Dr. Fernand Lamaze introduced the Lamaze Method in 1951, heavily informed by a trip to the Soviet Union, where he studied the medical findings of Ukrainian psychotherapist Dr. I.Z. Velvovskii. The Lamaze Method consists of relaxation strategies, breathing techniques, childbirth education, and emotional support from a trained specialized nurse. By the late 1950s, the knowledge of the method had reached the US, where Marjorie Karmel’s *Thank You, Dr. Lamaze* propelled it to wider audiences.

In 1989, educator and renowned hypnotherapist Marie “Mickey” Mongan designed the HypnoBirthing® technique, based on the previous work of British obstetrician Grantly Dick-Read. Dick-Read authored the book, *Childbirth Without Fear*, 45 years prior to the release of Mongan’s *HypnoBirthing: A Celebration of Life*. His theory argued that the use of hypnosis would assist birthing people in interrupting what he coined the “Fear-Tension-Pain syndrome,” where blood flowed away from reproductive organs to larger muscle groups in the ligaments. The obstetrician claimed in his 1933 book, *Natural Childbirth*, that “healthy childbirth was never intended by the natural law to be painful.”

The use of the term “natural birth” and its subsequent movement took off in the US during the 1970s, intended to restore agency for birthing people denied it in a more medicalized model. Though well intentioned, labeling certain births as “natural” insinuates there was a “correct” way of birthing a child—which of course, there is not.

(on monitor)

- 4.9** *Birth: A Film about Feelings and Experiences*, 1986
 46 mins
 Directed by Sheila Kitzinger
 Photography by Ivan Strasburg, Diane Tammes, and Mike Fox
 Sound by Mike McDuffie
 Edited by Franco Rosso
 Produced by Julian Aston
 A National Childbirth Trust Film produced by Julian Aston Productions

This film contains testimonies from women who have recently given birth, talking candidly about how they felt physically and emotionally leading up to their deliveries and then afterward. The testimonies are intercut with a sequence of a woman who is in the process of giving birth at home with a midwife, a doctor, and her husband. One woman talks about her birth aspirations: she wanted the experience to be “normal” and not part of a “sausage machine.” Birth advocate Sheila Kitzinger talks about the importance of education and breathing exercises and is seen hosting a National Childbirth Trust class in a home with a group. Three-quarters of the way through the film, Dr Frédéric Leboyer (the author of *Birth without Violence*) talks about the benefits of birth in water.

- 4.10** **A.L. Mills (American, active 20th century)**
Kuddle-Up Blanket, first produced in the 1950s
 Manufactured by Medline Industries (formerly Mills Hospital Supply), 1966
 Cotton

- 4.11** **Linda Foss (American, active 21st century)**
BoogieBulb Eco-Friendly Nasal Aspirator
 Manufactured by BoogieBulb, 2008
 Phthalate, biodegradable materials

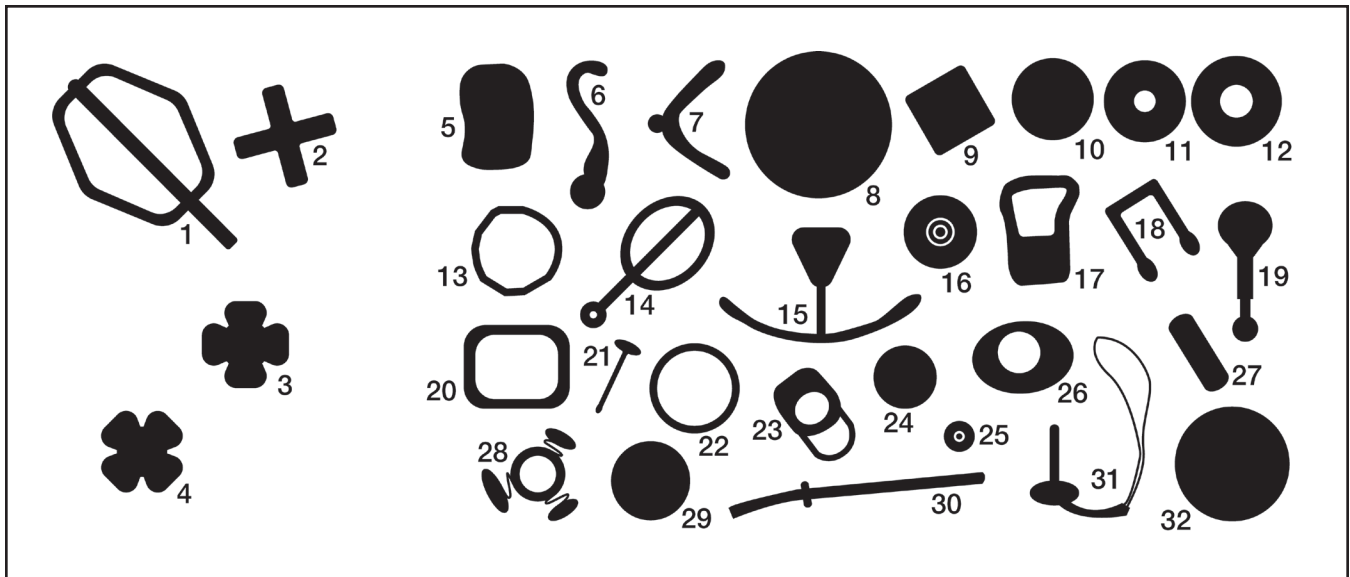
A simple white cotton blanket with alternating stripes of pink and blue along its edge, the Kuddle-Up is an iconic object found in countless standard hospital delivery rooms across the world. In 1910, a group of nurse-nuns approached apron maker A.L. Mills, who sewed aprons for Chicago’s meatpacking industry, to create hospital garments. As a result of their collaboration, the medical garment and textile supply business was born, and with it came various universal hospital designs including the jade green surgical gown and the Kuddle-Up blanket. The latter was inexpensive and durable, with pink and blue stripes denoting the gender binary.

Today, the US medical equipment and

supplies industry annual revenue is roughly \$88.5 billion. The blue bulb syringe is commonly found in discharge hospital packs for new parents or in the birthing kit of a seasoned midwife, utilized during delivery if the baby has meconium (stool) in their mouth or nose or nasal obstructions in the early weeks. The suction tip is often slightly larger than the opening of a newborn baby’s nostrils to ensure there are no injuries to their nasal passage during use.

1. Reia Pessary Prototype (Frankenstein 1)

4.12 Pessaries



2. Reia Pessary Prototype (Frankenstein 2)
3. Reia Pessary Prototype (V8)
4. Reia 4 (final prototype)
5. Curved Brass Pessary
6. Thomas-Cutter Retroversion Pessary in Vulcanite
7. Zwank Pessary in Wood and Steel
8. Double Concave Glass Disc Pessary
9. Cube Pessary in Gum Rubber
10. Brass Prolapsus Pessary
11. Rubber Doughnut Pessary
12. Hollow Plastic Ring Pessary
13. Solid Ring Pessary
14. Spooner's Pessary for Precenture in Pewter
15. Self Retaining Variation of Goddard's Ring and Stem Pessary
16. Gellhorn Pessary Reproduction in Lucite
17. Plastic Folding Hodge Bow Pessary with Support
18. V-Shaped Horseshoe Pessary
19. Ball and Stem Pessary in Vulcanite
20. Hodge Bow Pessary
21. Jackson Stem Pessary
22. Boil-to-Mold Ring Pessary
23. Thomas Vulcanite Prolapsus Pessary
24. Globe Pessary in Bakelite

25. Intra-Cervical Aluminum Stem Pessary
26. Hurd Retroversion Pessary in Vulcanite
27. Cylinder Pessary
28. Gum Rubber Ring Pessary with Brass Springs
29. Half-Globe Prolapsus Pessary, Brass Plated
30. Thomas-Cutter Stem Pessary
31. Self Retaining Cutter's Retroversion Pessary
32. Glass Globe Pessary

1-4 courtesy of Reia, 5-32 on loan from the Mütter Museum of the College of Physicians of Philadelphia

Pelvic organ prolapse is a widespread condition caused by a weakening of the pelvic floor muscles that allows the pelvic organs to descend into the vaginal canal. In extreme cases, the uterus may descend through the vagina and protrude outside the body. Prolapse affects a staggering 50 percent of people with vaginas over the age of fifty, and while it's not life-threatening, it can be life-altering in terms of one's relationship with one's own body, sex life, and mobility. Despite its prevalence, most people don't hear about prolapse until their diagnosis for reasons that range from lack of investment in design for women's health to shame and embarrassment about reproductive health.

A pessary is a device inserted into the

vaginal canal to support descending organs. In the past, pessaries have included pomegranates and balls of wool, or have been made from unyielding materials like wood, metal, or glass which were difficult for people to insert and remove independently. An all-female design team at Reia redesigned the pessary to be collapsible for easy insertion and removal. By collapsing to half its diameter, Reia's silicone pessary is designed to be easier to put in for exercise and to take out. The designers' goal—one that will be tested as it goes out into the market next year—is an approachable design that provides dignity and confidence to its users.

Adam Dubrowski (Canadian, b. 1972)

Christine Goudie (Canadian, b. 1980)

Artur Arutiunian (Canadian, b. 1999)

4.13 Perineal Repair Simulators, 2018 (open-source design)

Developed by MUN MED 3D, Memorial University, Newfoundland, Canada, and maxSIMhealth, Ontario Tech University, Ontario, Canada

**Manufactured by proxSIMity, Ontario, Canada
Polylactide, silicone**

(on monitor)

**4.14 Perineal Repair Simulator Video
6 mins**

The perineum is the area between the vulva and the anus. It can tear during birth or be intentionally cut. An episiotomy is a surgical cut of the perineum, usually made to hasten the birthing process. It is not always medically necessary—but in some countries often indicative of the increasing medicalization and standardization of birth. Around one-third of all postpartum people in the United Kingdom and US require stitches after childbirth from a torn or cut perineum. As with an obstetric fistula, a hole that can develop in the birth canal after prolonged labor, perineal lacerations can cause severe discomfort and incontinence. Skilled suture repair is important.

Dr. Adam Dubrowski, a scientist at Ontario Tech University, is part of a team that creates medical models for training purposes, including these 3D-printed perineal repair simulators. The team designed inexpensive and open-source files showing perineal tears of different depths and severity so anyone could print a simulator. The design team chose the hot pink color to avoid biases of race or ethnicity.

Forceps

(left to right):

**4.15 Chamberlen Forceps, Locking, 19th century reproduction of a 17th century design
Designed by the Chamberlen Family, England**

**4.16 Smellie Straight Forceps, c. 1752
Designed by Dr. William Smellie, England**

**4.17 DeLee Forceps, c. 1913
Manufactured by Lawton, Germany**

On loan from the Mütter Museum of the College of Physicians of Philadelphia

A forceps is an instrument for grasping, holding firmly, or exerting traction, in this case for encircling a baby's head to assist with the birthing process. While vital for some high-risk births, the use of forceps has always been controversial.

Forceps has undergone many changes since the tool's invention in the late 1600s by the Chamberlen (or Chamberlain) family in England. The family marketed their midwifery service based in part on their invention, which they kept a family secret for more than a century, the intellectual property offering them monetary gain. Eventually, they sold their design and medical providers introduced modifications over subsequent centuries. Scottish obstetrician William Smellie (1697-1763) was one of the first to do so. He separated the blades for more comfortable insertion and, in some cases, to conceal the tool from birthing people to prevent fear and panic—though this meant consent may not have been given for their use. He also wrapped leather around the blades themselves, believing this adaptation would reduce the temperature difference between the steel and the body. However, the absorbent materials could not be properly sanitized between uses and thus posed a dangerous infection risk.

**4.18 Martha Poggioli (Australian, b. 1988)
Incomplete Patent Chronology, 1838-2021,
Scheme A61F (6/00, 6/06, 6/08, 6/14 & 6/20),
2018-ongoing
Courtesy of the artist**

The objects in this timeline each depict a patent claim related to IUDs, pessaries, and other insertable technologies and devices relating to reproductive health. The drawings are proposed inventions, not necessarily objects that were

manufactured or distributed. Their designers saw sufficient value in designating each of the object's claims, and hoped they would eventually be manufactured, and of service to people. Each patent has a unique number ascribed to it. This chronological mapping presents an evolution of reproductive tools and typologies. Each of the devices can be defined within the category "A61F" in the Cooperative Patent Category classification system, sub classification 6/00: "Contraceptive devices; Pessaries; Applicators therefor." Patents on this map are taken from the US, China, Russia, Japan, Denmark, France, Korea, Spain, Switzerland, and the United Kingdom. Since starting this catalog in 2018, online databases containing these kinds of patents have vastly expanded, so this map will continue to evolve, and will likely never be complete.

5. Postpartum

Long after babies are out in the world, and placentas and body fluids have emerged in their wake, a postpartum person's uterus continues to bleed for days and weeks after giving birth. Nearly every newly postpartum person can't pee without it stinging, can't sit without wincing, and—especially those who have given birth for the first time—can't glance downward without being struck anew with the sights, smells, and volume of postpartum bleeding. The designs in this section reflect the various phases and experiences in the postpartum journey.

LaToya Ruby Frazier (American, b. 1982)

5.1 *Mom Making an Image of Me*, from the series *The Notion of Family*, 2008

5.2 *Momme Portrait Series (Floral Comforter)*, from the series *The Notion of Family*, 2008

5.3 *Huxtables, Mom and Me*, from the series *The Notion of Family*, 2008

Gelatin silver print

**Private Collection, Promised Gift to ICA
Boston**

LaToya Ruby Frazier's photographic, video, and performance work addresses a wide range of topics that touch on the personal and the political, from access to healthcare and the effects of deindustrialization to her family history. These photographs are part of a 2008 series of portraits featuring the artist and her mother posing in the latter's house in Braddock, Pennsylvania. The series mines the limits and bounds of Frazier's matriarchal household. Integrating her mother, and in other works her grandmother, into her practice Frazier cultivates a world where women create art rather than idly posing as subject matter, regardless of class and access to formal art education. Here, the pair are the subjects, the makers, and their own audience.

Frazier also acknowledges and expands upon the traditions of classic black-and-white documentary photography, and the images are themselves transformative acts, resetting

traditional power dynamics and narratives, both those of her family and those of the community at large. At the same time, the images are part of an ongoing exploration of the social, economic, and environmental deterioration of the artist's hometown of Braddock, experienced through the tangible and psychological effects on her family. By combining portraiture with social documentary, Frazier offers incisive views of everyday life.

(on monitor)

Willow Wisteria (American, active 21st century)

5.4 *Arabica Bengkung belly binding fabric and video*

5 mins

Hand dyed, unbleached cotton

Courtesy of Gabriella A. Nelson

The act of binding a postpartum abdomen after having a baby occurs across cultures. There's the Malaysian *bengkung* (displayed here), the Japanese *sarashi*, and the *faja*, which comes from the Spanish word for "wrap." Bengkung belly binding is a Malaysian tradition for women after birth meaning "cloth belt." In the Malay tradition, postpartum people wear the binding daily for the first forty-four days after birth. The bind is simply made from a long strip of breathable non-stretchy cotton, usually muslin. Belly binding presses the uterus inward, which in turn helps the uterus stay firm and return to its pre-pregnancy size. This aids in pushing out any blood clots, which can shorten bleeding after birth (lochia). Belly binding is also

believed to press together separated abdominal muscles, a condition called *diastasis recti* that is common for postpartum people.

John L. Cox (Scottish, active 20th century)
Jenifer Holden (Scottish, active 20th century)
Ruth Sagovsky (Scottish, active 20th century)
5.5 The Edinburgh Postnatal Depression Scale (EPDS), 1987

Ranging from “baby blues” to severe psychosis, postnatal mental distress is “the most common complication of childbearing” and often goes undiagnosed or is underdiagnosed due to the still-taboo nature of mental illness as well as stereotypical expectations of joyous maternity. The Edinburgh Postnatal Depression Scale (EPDS), a standardized screening tool for postpartum depression, was designed by John L. Cox, Jenifer Holden, and Ruth Sagovsky in Scotland in 1987. Now used worldwide in more than sixty languages, its ten straightforward questions set the threshold for clinical intervention, though its designers caution that the tool should never be used in isolation, without reflection on the patient’s wider social support. Cox reports that clinicians should be careful using the tool, as “it has no items that tap directly the family relationships, is in no sense a check list of depressive symptoms, and converts a mood state into a numerical score.”

Over the span of the current global pandemic, lockdowns and restrictions have impacted mental health as many have juggled roles as a new parent, caregiver, essential worker, homeschool teacher, and partner, among others. In the US, it is estimated that one in seven postpartum people will suffer the most common complication of childbirth: postpartum anxiety or depression.

5.6 Generic postpartum mesh underwear, 21st century

Eden Laurin (American, b. 1983)
Mia Clarke (British, b. 1983)
Aubrey Howard (American, b. 1985)

5.7 Nyssa FourthWear, 2019
Nyssa (est. 2018, US)
Courtesy of the designers

These stretchy panties that encircle a swollen abdomen and perineum are designed to contain

uterine discharge and hold in place preparations that ice, heal, and offer localized pain relief. Provided by hospitals, birthing centers, and home birth kits alike, or sold for a few dollars online, they are most commonly mass-manufactured in an expandable synthetic mesh that holds disposable mattress-like maxi pads. It’s a design encountered by most postpartum people who pass through a developed world health-care system, regardless of where the birth took place. Disposable postpartum underwear, cousin to adult diapers, are an offshoot of research that began in the 1930s into commercial variants for babies. These were combined with earlier technologies for sanitary napkins that emerged at the turn of the twentieth century.

Nyssa’s reusable FourthWear postpartum underwear follows in the design footsteps of brands like Thinx and Knix, which have begun to raise public awareness—and reject social shame—around bodily fluid leakage and adult incontinence. Nyssa underwear are fashioned of flexible, breathable fabric made from post-consumer recyclables and contain a kangaroo-style pouch into which one can slip reusable heat or ice packs. Representing a rejection of the discardable design culture of the twentieth century, FourthWear undies can be washed and reused, and their packaging doubles as a diaper carrier.

5.8 Rose Quartz Yoni Eggs, 2017
Manufactured by Nerissa Nefeteri
Rose quartz
Courtesy of Gabriella A. Nelson

5.9 Perineal Irrigation Bottle
Medline Industries, Inc. (est. 1966, US)
(formerly Mills Hospital Supplies, Inc., est. 1910, US)
Polyethylene

5.10 Elvie Perineometer, 2015
Manufactured by Elvie (est. 2013, England)

5.12 ScarAway
Clear Silicone Scar Sheets for C-section

In 1946, Dr. Arnold H. Kegel designed the perineometer to help measure and strengthen the pubococcygeus muscle, which can weaken after childbirth and cause discomfort, pain, or incontinence. Named for the perineum (the area that extends between the vulva and anus) and the meter (for measure), the device had a rubbery

end that was to be placed inside the vaginal opening; the user would then contract their pelvic floor muscles, sending a whoosh of air through the flexible pneumatic chamber, up through the hollow tubing, which was connected to a manometer calibrated from zero to one hundred millimeters. Kegel's focus on musculature shifted medical practice from a default to surgery towards rehabilitation, illustrating that retraining muscles could improve postpartum urinary-stress incontinence.

Pelvic floor therapists working today use biofeedback and electronic stimulation devices that measure muscle activity, ensuring that the many pelvic floor muscles work together, firing and releasing as necessary. While a number of these devices are high tech (like the Elvie, many connect to smartphones via Bluetooth), others are decidedly unplugged (including vaginal weights or Yoni eggs for example). In some countries—France, Denmark, and Germany in particular—pelvic floor therapy is standard care for all postpartum people, seen as preventative medicine and a long-term cost-saving health strategy, transforming pelvic floor issues from a shameful condition that one must endure to a normal occurrence over which we have agency.

The more modern perineal irrigation bottle, a plastic container akin to a diner ketchup dispenser, completes the toolkit, giving those navigating the injured area left after a vaginal delivery a way to squirt pH-balancing water against their urine flow to temper the sting on stretched or stitched flesh.

A cheap and accessible design like the perineal irrigation bottle, silicone scar strips like ScarAway are often used to reduce itchiness and discomfort of a healing incision left after a Cesarean birth.

5.11 Breastfeeding Demonstration Set, 2021 Knitted in Greenwood, Nova Scotia Wool

Part of the history of functional craft, this type of breastfeeding demonstration aid is popular with midwives and (in the UK) with health visitors and nurses that visit postpartum people at home as part of the free National Health Service. They are used to show the best way to get a baby to latch on to the nipple and how to mold or hold the breast to get the nipple in the right position for the baby's mouth. They're also used to teach how to express milk and how to deal with problems like blocked ducts. Downloadable patterns abound, for example, on the website of the Lactation Consultants of Great Britain.

6. Milk

Milk can be nursed, extracted by a pump, obtained from donors, or created in a lab and sold over the counter. For some, feeding babies is a deeply enjoyable or even sacred act, and for others it can be a fraught business. Debates over what is “best” often drown out the truth that empowers people to make the decisions that feel right for them. WHO guidelines encourage breast milk as an appropriate source of nutrition for infants through six months of age and beyond. This recommendation respects cultural and economic realities for many, but for others it is impossible due to individual well-being or a lack of appropriate public or workplace accommodations. In the US, almost a quarter of postpartum people return to work within ten days of giving birth, making it often impossible to continue to produce milk and meet WHO recommendations. While the designs here may appear to ease feeding, what they don’t show is the labor involved, which—whether it’s endless breast pump sterilization or cracked nipples—often falls to women.

6.1 Various baby bottles, 20th-21st century

Benjamin Spock (American, 1903-88)

6.2 *The Common Sense Book of Baby and Child Care*, 4th edition, 1976

Mabel Liddiard (British, 1882-1962)

6.3 *The Mothercraft Manual*, 11th edition, 1938

“It is not conceivable that women entering into any other vocation of life would think of undertaking it without deliberate preparation. Motherhood is so precious and wonderful that we fear to think of it in terms of definite preparedness. We like to think that it comes natural to be good mothers and that to study in preparation for it or to analyze it might produce more harm than good.” So wrote Mabel Liddiard, founder of the Mothercraft Training Society, which established its own infant welfare clinic in London, with a dietetic hospital, and ran a yearlong training course from which students emerged as qualified nursery nurses.

The Mothercraft Manual went through twelve editions; this one has a pull-out centerfold chart that suggests that the average weight gain in the first year of life more than triples (from 7.5 to 22 lbs.), while a general expectation is that babies grow in height by a half inch each month in their first year. Adequate feeding, either by breast or

bottle, was encouraged through lactation advice and recipes for formula, as in the words of Dr. Spock who came along a few decades later.

6.4 Phenix Breast Pump, c. 1879 Manufactured by Whitall Tatum & Co., USA On loan from the Mütter Museum of the College of Physicians of Philadelphia

6.5 Willow Wireless Breast Pump, 2021 First generation released in 2017

6.6 Gerber Battery/Electric Breast Pump Kit, 1990s

6.7 Haakaa Breast Pump, 21st century

Einar Egnell (Swedish, 1880-1976)
Sister Maja Kindberg (Swedish, 20th century)

6.8 Egnell SMB Breast Pump, c. 1956

Early mechanical breast pumps were cumbersome, loud, and fairly painful for lactating people. Einar Egnell, a Swedish civil engineer, was one of the first to design a breast pump. He specifically observed human anatomy—rather than bovine subjects—after his friend, a

gynecologist, challenged him to improve upon existing technologies in the mid-1950s. The resulting Egnell SMB breast pump (1956) was named for Sister Maya Kindberg, the nurse who collaborated on its testing in concert with new mothers in Stockholm’s maternity hospital. Pumps were initially confined to medical quarters—and thus largely unavailable—until later in the twentieth century. The at-home electric pump was not developed and widely marketed until the early 1990s.

In 2010, the breast pump experienced its biggest public boost when the newly passed Affordable Care Act mandated that insurance must cover its cost. The breast pump is lauded as a product that helps lactating people move with freedom while still being able to breast- or chest-feed their children. As such, it fits neatly with other “time-saving” devices intended to maximize productivity, including washing machines, kitchen blenders, and hair dryers, while making such labor look effortless. Little wonder the breast pump is operated out of sight.

The effort to operate the breast pump has not been matched by the effort to improve the machine’s design. In 2017, Jessica Winter pointed out in *The New Yorker* the “surprising and incalculable” lack of investment in product designs for pregnant people, and the amount of money Silicon Valley “kingmakers are leaving on the table by shunning women and mothers and babies. Breast pumps make up a seven-hundred-million-dollar market, with ample room to grow.” Contemporary design updates include the 2018 prototype from Naya Health that used water suction (it turned out that water contaminated the extracted milk, and the company folded), the second generation of the in-bra, cordless Willow, and the Haakaa manual pump, which seals to the breast and can work independently or be manually massaged.

(on monitor)

**6.9 Make the Breast Pump Not Suck Team, 2018
MIT Media Lab, Cambridge, Massachusetts
www.makethebreastpumpnotsuck2018.com
Courtesy of the designers**

Over the past five years, a multidisciplinary group of designers, technologists, and community partners have convened twice at the Massachusetts Institute of Technology’s Media Lab to reimagine the future of breastfeeding. In 2014, more than one hundred people gathered to rethink the breast pump, a technology rarely

a focus of product and industrial designers. In 2018, a second gathering widened the focus to a redesign of policies surrounding paid familial leave, breastfeeding in public places, and health-care innovation. The summit convened 300 collaborators from diverse backgrounds to create better products, programs, policies, and systems to support breastfeeding and pumping with a focus on equity.

Called “Make the Breast Pump Not Suck” (MtBPNS), the project solicits and embraces marginalized individuals and their perspectives, centers the lived experiences of breastfeeding people and their bodies, and breaks taboos related to bodies and bodily fluids. By adapting (and co-opting) the “hackathon” format, MtBPNS serves as an interventionist project designed to change the culture of technology design.

While lactation breaks and dedicated spaces for pumping are now required by federal law, many workspaces still lack adequate facilities. As MIT’s “Make the Breast Pump Not Suck” Hackathons in 2014 and 2018 highlighted, by its very existence the pump exposes the lack of a far more holistic design for family leave.

**6.10 Maria Eife (American, b. 1977)
Dress Flanges, 2019
Nylon and metal
Courtesy of the artist**

Invited to create a work in response to the collection of the Mercer Museum in Doylestown, Pennsylvania, Philadelphia-based jewelry designer Maria Eife gravitated toward the butter prints housed in the museum’s dairy room. Generations before, pats of butter were pressed into these prints to give them each a decorative shape that would make it stand out from that produced by other vendors. As a new mother, Eife felt a kinship with these milk-oriented designs that allowed the production of milk to shine instead of, as she was beginning to experience with her own breastfeeding, remain secret. Her response was to create these dress flanges, both 3D printed and fashioned in metal, lavishing care on their design. The intention is that they are worn with pride, adorning the part of a pump as it attaches to the breast that are otherwise standard and usually never seen in public.

**6.11 Pewter Nipple Shield Containing Lead,
c. 1775-1825**

6.12 Boxwood Nipple Shield, c. 1800-1850**6.13 Glass Breast Shield, c. 1850-1900**

On loan from the Mütter Museum of the College of Physicians of Philadelphia

A nipple shield is a sheath worn over the areola and nipple during breastfeeding. Modern nipple shields are made of soft, thin, flexible silicone and have holes to allow the breast milk to pass through. They provide a larger surface for the baby to latch onto, and can offer some protection for the nipple if it is sore. These eighteenth and nineteenth century examples serve similar functions. The glass design was meant to catch milk under clothing while not feeding and features a hole to empty collected milk.

Aimee Gilmore (American, b. 1982)

6.14 *Pushed & Pulled*, 2017

**Chrome plated breast pump and baby bottle
Courtesy of the artist**

Gilmore's work engages the material culture and everyday routines of the care work of growing and raising infants, labor that is often heavily gendered, socially devalued, and unpaid. By adding a chrome veneer to quotidian objects like a breast pump or a baby bottle, her work highlights the designed qualities of such objects, and makes permanent a moment in parenting that can seem both fleeting and interminable. As Gilmore says, "Time is different as a mother. I try to re-imagine the first few days or weeks or even months in this role, but it feels almost dreamlike. I cling to the now discarded objects, the relics of their smallness. I save them, I honor them, I cut them apart, I put them back together, I coat them, I encapsulate them. I line them up proudly like trophies; awarding myself the permission to long for the times I once prayed would go by faster. These are monuments to motherhood."

Ani Liu (American, b. 1986)

6.15 *Untitled (pumping)*, 2022

Technical advising by William Liu and Julian Goldman

Food grade tubing, liquid pump, air pump, steel bracket, brass tube adapters, hose clamps, valve adapters, valve splitters, solenoid valve, microcontroller, synthetic milk

6.16 *Untitled (labor of love)*, 2022

Data containing the first 30 days of feedings and diaper changes in caring for my newborn Vinyl

Courtesy of the artist

Artist Ani Liu gave birth to her second child in the same month that she took up a new professorship. She was not afforded any maternity leave, an experience common to many people in the US where around a quarter of postpartum people go back to work within ten days of giving birth.

Because she had no choice but to return to work immediately, Lui has spent a lot of time with her breast pumps, which allows her to continue creating breast milk for her infant to eat. Every two days, she creates approximately 56 ounces of breast milk with her body, which is the volume shown circulating between this vitrine and tubes. While she can appreciate the technology that allows her to continue to feed her baby breastmilk, she questions the hidden labor ("My calendar is filled with half hour blocks reserved to pump and clean the parts") that occurs on top of all the other work she performs. The artist reflects:

Among the many places I've pumped: on the train, in various closets, in transportation stations, in restaurants, in parking lots, in bathrooms, and in my studio. In the beginning, the feeling of my baby's suckle and his cute face caused me to let down. These days, the mechanical rhythmic sound of my pump triggers the reflex. In my practice, I have long been interested in the relationship between technology and the body but my relationship with my pump really cemented the cyborg identity for me. I feel a certain intimacy with my pump, and in a way, it allows my body to feed through space and time.

(on monitor)

Corrine Botz (American, b. 1977)

6.17 *Milk Factory*, 2021

10 mins

4K video color, sound

Courtesy of the artist

Milk Factory focuses on the Longworth House of Representatives lactation room. This bipartisan

space was established in 2007 when Nancy Pelosi became speaker. The footage was filmed days before the Capitol closed to the public after COVID-19 was declared a national emergency, and a year before the Capitol insurrection in Washington, D.C. One of the filming dates coincided with the passage of the Federal Employee Paid Leave Act (FEPLA). Despite this advance, the US remains the only high-resource country in the world that does not offer mandated paid family leave. Without paid leave, many postpartum people return to work soon after giving birth, which contributes to the pervasiveness of pumping in the workplace. Focusing on the gendered nature of care work and filmed in the very place where laws are decided regarding parental policies and reproductive rights, this film is especially relevant in light of the pandemic, which has underscored the systemic failings and institutional barriers that largely affect working parents, especially women of color.

(projection)

Tabitha Soren (American, b. 1967)

6.18 MOTHERLOAD

Shot in 2006-2007, conceived and printed in 2021

Courtesy of the artist

The artist used a suspended camera to capture images of the first three months of life for a mother-baby dyad which she then layered to evoke the immediate postpartum period. The project is not meant to capture a singular moment of care or tenderness, but instead aims to share the blur of cumulative, almost unregistered days of hazy, repetitive gestures of newborn parenting life. Soren intentionally clouds the visual field with these accumulated experiences, a way to explore the erasure of boundaries between two bodies.

Originally shot in 2006 and 2007, the project began “as a hedge against life as a mother overtaking life as an artist.” The images were developed and codified as a series fifteen years after they were shot. Soren reflects, “There have always been women artists, including very driven ones, who have never harbored doubts about the feasibility of straddling the line between motherhood and creative accomplishment. Motherload is not for them.”

Aimee Gilmore (American, b. 1982)

6.19 Milkscapes (series)

2016–ongoing

Breast milk on mylar as inkjet print fabric pillows

Aimee Gilmore began her MFA when her daughter Maya was three months old. Gilmore recalls a time in graduate school when her professor, glancing at her desk during a studio visit, mistook her breast pump for an air horn. Gilmore trained her attention insistently on the materials that were part of the care work she undertook for her infant daughter each day, including her own breast milk. When she accidentally spilled onto mylar some milk that she had laboriously pumped, the residue patterns intrigued her—what she termed “the material trace of my transition into my new role as mother.”

7.

Midwives

The World Health Organization (WHO) and a 2014 Lancet series defines midwifery as “skilled, knowledgeable and compassionate care” for childbearing people and their infants and families. Until a few centuries ago, many aspects of women’s reproductive health took place at home, largely attended by midwives from local communities.

In the US, the practice of midwifery was rooted in shared skill and wisdom, especially the expertise of Indigenous and later, Black women. Likewise, immigrant women to the US possessed and maintained midwifery and home-based healthcare practices from many cultural backgrounds. Gradually, modern medicine claimed that such matters were the preserve of hospitals staffed by university trained doctors, who were predominantly White men. Historically, medical providers have long viewed female bodies as imperfect versions of male ones, and pregnancy as a diseased condition. In contrast, one of the hallmarks of the midwifery model of care is meeting birthing people where they are. The US is currently home to the highest rate of maternal mortality in the developed world, which skews even higher for birthing people of color, particularly and precipitously for Black and Indigenous populations. Around 10 percent of US births are midwife-attended compared to more than 50 percent in other high-resource countries. WHO and other international global health experts recommend that a simple way to improve maternal and newborn outcomes, reduce rates of unnecessary interventions, and realize cost savings is to support pathways to practice for more midwives.

Alice Stockham (American, 1833-1912)

7.1 *Tokology: A Book for Every Woman, 1892*

Dr. Alice Stockham was an obstetrician and gynecologist who promoted gender equality, the right to use birth control, and the right for women to be sexually fulfilled (for her, this meant in their marriages). Dr. Stockham was especially concerned with the economic plight of divorced women and young women with children. She offered *Tokology* for free to those who could not afford it, and some copies came with a certificate for a free gynecological exam.

Tokology is Greek for obstetrics or midwifery, and the book covers all aspects of women’s and children’s health for readers who are not physicians. Stockham dedicated the book to her daughter and secondly “To all women who, following the lessons herein taught, will be saved the suffering peculiar to their sex.”

Raven Lang (American, b. c. 1943)

7.2 *The Birth Book, 1972*

Ina May Gaskin (American, b. 1940)

7.3 *Spiritual Midwifery, 1976*

Knowledge from birth workers has often been passed down orally. In the early ‘70s, a time when very little had been published specifically for families about birth, Raven Lang was a self-trained midwife in Santa Cruz, CA who opened a birth center and authored *The Birth Book*. She found a potential publisher, but was told that she would have to remove all pictures of vulvas and bottoms, and so chose to self-publish. Ina May Gaskin’s *Spiritual Midwifery* emerged just a few years later and has since become a classic. Both Gaskin and Lang lived in Northern California at the time they wrote, and argued for the safety and care of a well-planned home birth. Gaskin had forceps used on her in a hospital during the birth of her first child and found the experience

so negative that, with her husband Stephen, she founded a commune called The Farm in Summertown, Tennessee. There, she and the midwives of The Farm created The Farm Midwifery Center, one of the first out-of-hospital birthing centers in the US.

We have picked these examples because of their striking cover designs, but many other birth workers of the twentieth century have equally important wisdom to impart. We urge you to seek out the following: Onnie Lee Logan (1910-1995), *Motherwit: An Alabama Midwife's Story* (1989), Margaret Charles Smith (1906-2004), *Listen to Me Good: The Life Story of an Alabama Midwife* (1996), and Gladys Milton's (1924-1999) memoir, *Beyond the Storm: An Extraordinary Journey* (1997).

7.4 Stork Umbilical Clamps, c. early 20th century On loan from the Mütter Museum of the College of Physicians of Philadelphia

Used primarily by midwives, from the nineteenth century onward, umbilical clamps—used to help stop bleeding from the blood vessels in the umbilical cord once delivery has occurred—were made of plate or sterling silver to avoid corrosion. The stylized stork decoration indicated their tie to birthing and, eventually, sewing scissors embraced this motif too. It is thought that the crossover occurred when midwives brought their sewing work to deliveries to pass the time while waiting on labor and delivery.

7.5 Pinard's Ear Fetal Stethoscope Manufactured by Miltex Germany On loan from the Mütter Museum of the College of Physicians of Philadelphia

Part stethoscope, part ear trumpet, the Pinard is a simple horn-shaped object made of wood or metal. When the French obstetrician Adolphe Pinard designed his fetal stethoscope in 1895, the device revolutionized medicine, but it was also just one step removed from pushing one's ear up against a pregnant belly. The Pinard is uncomplicated, inexpensive, and unquestionably safe. Unlike ultrasound, it doesn't require batteries or external power sources, and training to use it is simple and intuitive. Although the Pinard's Ear is all but obsolete in the US, its simple design is a favorite of midwives in many other regions, still used everywhere from Mali to Denmark.

Zubaida Bai (Indian, b. 20th century)

7.6 Janma Clean Birth Kit, 2011 Courtesy of ayzh Ltd.

According to the World Health Organization, more than 800 people die every day in pregnancy and childbirth from preventable causes such as sepsis and other severe infections. After encountering a midwife in rural India who did not have access to sterile tools, mechanical engineer Zubaida Bai created an improvised clean birth kit for under \$2 that she calls Janma, which means "birth" in Sanskrit. Each kit contains off-the-shelf tools to create sterile birth conditions: an apron, a sheet, antiseptic soap, a cord clip, and a surgical blade. In 2010, Bai founded the health-care company ayzh, which has distributed more than a quarter million kits in India, Afghanistan, Gambia, Laos, Ghana, Malawi, Nigeria, Zambia, and Haiti, reaching half a million birthing people and babies.

(projection)

George C. Stoney (American, 1916-2012)

Mary Francis Hill Coley (American, 1900-1966)

Georgia Department of Public Health

7.7 All My Babies: A Midwife's Own Story, 1953 16mm film converted to video 55 mins

**Added to the Library of Congress National
Film Registry, 2002**

Courtesy of the Library of Congress

All My Babies: A Midwife's Own Story was released in 1953 as a training aid for midwives and other health professionals at a time when birth was moving from the home to the hospital. It depicts the critical role of Black midwives in communities across the American South.

Commissioned by the Georgia Department of Public Health, filmmaker George C. Stoney shadowed midwife Mary Francis Hill Coley for four months in Albany, Georgia. The brief from state officials was to include 118 separate points within the film, from managing relationships between the midwife and public health specialists, to breathing techniques during labor, to incorporating partners and siblings into the birthing process. Stoney was partially inspired by the work of Italian neorealist directors, whose films of the 1940s and early 1950s were shot on location using nonprofessional actors and foregrounded the stories of the poor and working class. However, it was the evocative photographs of Walker Evans, Dorothea Lange, and others who—commissioned by the Farm

Security Administration—documented the Great Depression that he later cited as most influential.

While some acting was involved, actual homes, streetscapes, and medical offices were the backdrops for prenatal exams, and the film centers on—and shows in detail—two births that Coley attends with skill and high standards of hygiene. Filmed during the Jim Crow era, the film records the uncomfortable and enforced deference of Black midwives interacting with White doctors and nurses at the county clinic, and even shows Coley questioning her own excellent hygiene practices after a group lecture by a White doctor.

All My Babies foreshadows the demise of Black midwives who once provided critical care for poor and rural pregnant women of all races throughout the American South. Indispensable within their communities, they passed their knowledge down through generations during the institutionalized racism and violence of slavery in the antebellum period. Black midwives were also crucial during segregation; at a time when Black women were often denied admittance to hospitals, midwife-attended home birth was frequently the only viable option for Black families. The film paints a rare portrait of how Coley's model of care coexisted alongside the growing medical-industrial complex, and of how Black midwives and their patients worked within a racist medical system.

8. Temporary Bodies

Coined by fashion historian Lauren Downing Peters, whose work focuses on cultural constructions of body size and shape in fashion, the notion of a “temporary body” applies to most humans. We change due to aging, illness, and what we eat, to name only a few factors. The designs in this section respond to the ways in which the human body moves through temporary states in different moments of the reproductive arc and infancy.

8.1 **Scottish Baby Box, 2017-ongoing** **Courtesy of the Scottish Government**

In Finland between the two world wars, a new generation of community-minded government officials and designers addressed urgent social and economic concerns of Finnish citizens. They created schools and health centers and, in 1938, the Finnish Social Welfare Committee introduced a novel public health intervention: the *äitiyspakkaus*, a box full of baby clothes and baby-care items designed to be distributed to low-income pregnant people in each of Finland’s municipalities. By 1949, and continuing today, the benefit was available to all expectant Finnish citizens, including adoptive parents.

Inspired by the Finnish precedent, the Scottish Baby Box contains everything from baby clothes and a blanket to a thermometer and nursing pads. Billed as a design to give every child in Scotland an equal start in life, the box itself can be used as a crib, and its exterior can be colored in by older family members. Inside there is plenty of helpful information, as well as a specially commissioned poem from the Scottish poet laureate, Jackie Kay.

Owen F. Maclaren (English, active 20th century)

Andrew Maclaren Ltd., England

8.2 **B-01 “Umbrella” Baby Stroller, 1966** **Aluminum alloy tubing and saran polythene fabric**

Owen Finlay Maclaren, an Englishman and aeronautical designer with Scottish roots, applied his decades of experience designing fighter plane components to the problem of perambulating his young grandchild, Anne, while she was visiting him in the early 1960s. Maclaren’s collapsible “folding baby carriage” B-01 prototype is the infant-focused cousin of Marcel Breuer’s Bauhaus furniture designs of four decades earlier. Like Breuer, Maclaren pared his product down to its essential components, using lightweight aluminum. The bare bones result weighed just six pounds, less than many newborns. Its simple fabric “chair” made a perfect canvas for bright, eye-catching graphics. Maclaren took the design to Silver Cross, which rejected the concept, thinking there would be little market interest. So Maclaren formed his own company. A decade after his stroller’s debut, more than 600,000 were being produced annually.

Ann Moore (American, b. 1934)

Lucille Aukerman (American, 1909-83)

8.3 Snugli, 1971

Manufactured by Snugli, Inc.

Seersucker

The baby carrier (known by countless other names and the world over, including Plains Indian cradleboards, the pan-Asian *mei tai*, Korean *podaegi*, and Colombian *rebozo*) is perhaps one of the oldest worn accessories. Used in a range of ways, including as a sling (sometimes fastened with a ring), a wrapped fabric length, and a sewn (and sometimes buckled) soft bucket shape worn on front or back of the caregiver (who, if not the child's parent, might be older siblings, grandparents, or other members of an extended family), the item has become increasingly used in postindustrial countries since the 1960s, a co-option of everyday practices in many other parts of the world.

The Snugli was one of the first mass-produced designs for a baby carrier, and arrived just in time for a specific set of US parents (usually middle class and White) hoping to bond more closely with their children than their own parents had. Trained as a pediatric nurse, Ann Moore and her husband, Mike, were part of the first generation of Peace Corps volunteers in the 1960s. While living and working in Togo, West Africa, they were struck by the close bond facilitated by a length of cloth used to bind babies, from newborn infants to toddlers, to their caregivers' fronts or backs. When they returned to the US and had their own daughter, Mandela, Ann asked her mother to help her fashion something similar. After several iterations, the Snugli—an early mass-produced baby carrier for the US market—was patented in 1969.

8.4 Prefold Cloth Diaper and Snappi Fastener, 2017 Unbleached birdseye cotton and polyurethane

Sergio Gonzalez (Mexican-American, b. 1992)

Julie Xu (Chinese-American, b. 1997)

Annie Wang (Chinese-American, b. 1998)

Jolee Nieberding-Swanberg (Chinese-American, b. 2000)

8.5 Sorbit Biodesigned Diaper, 2018

Biodesign Challenge, University of California, Davis

Courtesy of the University of California, Davis

Until the mid-twentieth century, diapering babies in the US meant folding and pinning cloth toweling

in place, and then tugging a pair of rubber pants overtop to minimize leaks. One night in 1946, a Connecticut housewife, Marion Donovan, was faced with a wet, crying baby yet again. Her shower curtain caught her eye. Three years and many shower curtains later, Donovan had designed the Boater, a reusable diaper cover made of surplus nylon parachute cloth that paved the way for the disposable diaper we know today.

Yet, most histories of the diaper gloss over Donovan's contributions, focusing instead on Victor Mills, the chemical engineer at Procter & Gamble who created Pampers in 1961, more than a decade after Donovan designed the Boater. Today, disposables account for more than 90 percent of all diaper changes in the US, with about eighteen million disposable diapers ending up in American landfills each year. The environmental impact has prompted some parents to look for alternatives from a pre-disposable world. Many have turned back to washable and reusable cloth diapers.

Yet any diaper uses planetary resources, and introducing any waste to landfill or sewers has an impact. Sorbit is a prototype for a biodegradable diaper made with bacterial cellulose grown on agricultural waste. It can be composted after use. It was shown at the Biodesign Challenge in 2018, a worldwide competition that offers students opportunities to envision the future with biotechnology.

Ryan Mario Yasin (British, active 21st century)

8.6 Petit Pli, 2017

Courtesy of the designer

Petit Pli children's clothing grows along with the child who wears it. Ryan Mario Yasin originally trained as an aeronautical engineer and was inspired by his young niece and nephew; he bought them clothing only to find they had outgrown the gifts by the time he delivered them. As Yasin points out, children grow an average of seven sizes in their first two years, frequently requiring new clothing. In response, his designs focus on versatile outerwear pleated to stretch and grow "bi-directionally" in tandem with the child, snugly fitting a range of sizes from four months to three years of age. The proprietary Petit Pli textile is designed as a windproof and waterproof overlayer that resists the demands of clothing worn by children, especially tearing and staining. It is also a recycled mono-fiber, which means it does not have to be separated into component fibers for continued recycling.

Petit Pli garments point toward a new paradigm for reducing waste in the fashion industry and altering attitudes about consumption and the care of clothing in the long term.

(on monitor)

Ari Fitz aka Arrows

8.7 My Mama Wears Timbs: A Short Documentary on Motherhood & Masculinity, 2017

7 mins and 5 secs

Color, sound

Courtesy of the artist

The model Arrows (also known as Ari Fitz) explored the intersection of masculinity and pregnancy in their short documentary portrait, *My Mama Wears Timbs*. It focuses on a fellow masculine queer woman of color, Frankie Smith. Shot in 2017, the documentary honors Smith's identification as a tomboy—the “Timbs” are Timberland boots—as an important representation of motherhood. Smith talks about the ways in which clothing usually helps define their identity. Jeans and a T-shirt from the men's rack allow Smith to face the world “like how I want to present myself.” Yet, as Smith's pregnancy developed, they had to turn to maternity clothing to cover her bump, especially at work, which entailed garments designed specifically for women. Their aesthetic complicates—and sometimes outright confounds—Smith's preferred ways of presenting identity:

They show off all my new curves ... I have to, like, prepare myself to go out into the world as someone that I wouldn't normally portray myself as. It's just uncomfortable ... I never want to do anything after work that is social without changing because I don't want any of my friends to see me in these women's clothes. It's just ... tough.

Chas L. Lewis, Inc. (Hollywood, CA)

8.8 Two-Piece Romper with Maternity Stretch Panel, c. 1960

8.9 Butterick Classics Pattern, 5784 Misses' Maternity Dress, Scarf & Collar, 1987

8.10 Staylastic Elastic Maternity Stretch panel #696, c. 1940-50

With the abandonment of any pretense that pregnant women should attempt to maintain the dangerously wasp-waisted mid-century silhouette, in the later twentieth century maternity fashions began to adopt looser silhouettes. Lightweight stretch fabrics were increasingly available in ready-to-wear garment designs, although one tried-and-tested way to make maternity fashion meet one's own personal style is to sew at home or get something tailor-made.

Transport for London (TfL)

8.11 Baby on Board badge, 2005

8.12 Don't Touch My Bump button, 2021

Developed by the in-house design team at Transport for London (TfL), which manages that city's public transport network, the Baby on Board button (or badge to use the British term) was introduced in 2005. It has since proved so popular that more than a million have been distributed to pregnant people with the aim of making their journeys around London calmer, safer, and more comfortable.

The button evokes the most powerful elements of the London Underground's design heritage: the bespoke typeface and the bulls-eye symbol that were designed for the network by the calligrapher Edward Johnston in the late 1910s. Both projects were commissioned by the Underground's then commercial manager, Frank Pick, who commissioned marketing campaigns that portrayed the Underground as a safe, efficient, affordable way for its passengers to make the most of London's city center and leafy suburbs. Johnston's trim sans serif typeface was designed to be legible and instantly recognizable, as was his 1917 redesign of the original bulls-eye symbol, devised by Pick in 1908.

Next to it is a homemade button available on Etsy. Both buttons highlight the ways in which pregnant people must negotiate and contend with public interactions.

Page Boy

8.13 Two-Piece Suit Set, c. 1954 Synthetic material

Page Boy

8.14 Tie-Waist Skirt, c. 1960 Synthetic material

8. Temporary Bodies

In the US, maternity clothing grew out of the long-overdue recognition and subsequent accommodation of the pregnant body. Hugely popular between 1939, just after it was patented, and 1959, the year that stretchy lycra fabric was invented, the tie-waist skirt drawstring encircled the growing belly, while a vertical tab connected the skirt to this waistband. As pregnancy progressed, the vertical tab could be let out and fastened to fit with a series of snaps—adjusting for fit while maintaining an even hemline. The tie around the waist was adjusted as the wearer’s hip and rib circumferences expanded.

Run by sisters, the Dallas, Texas-based maternity line Page Boy opened their first boutique next door to an obstetrician’s office in 1938 and went on to become a hugely successful US maternity garment manufacturer. Combined with a childlike language of bows, tented tops, and Peter Pan collars, tie-waist skirts masked what was still often unutterable in polite society. Using clothing to hide pregnancy was an overwhelming social norm of the time. In the US, maternity corsets were advertised in newspapers and women’s publications well into the 1930s. Fashion editorials addressing pregnant readers in mainstream publications emerged slowly from 1900 onward and highlighted darted, pleated, and laced dress types that could play down a pregnant woman’s changing shape.

- 8.15 **Alison Croney Moses (American, b. 1983)**
***My Belly*, 2021**
Part of the series ***My Black Body***
Cedar wood, milk paint
Commissioned for the ***Designing Motherhood***
exhibition by the **Maternity Care Coalition**
Advisors
Courtesy of the artist

Alison Croney Moses studied furniture design at the Rhode Island School of Design and lives in Jamaica Plain in Boston where she provides opportunities for young people to be empowered through craft and the arts as the Associate Director at the Eliot School of Fine & Applied Arts. Alison creates sculptures with wood, a material that even after being cut down still mimics life, changing with its environment. In Alison’s own words:

Pregnancy and motherhood are life changing and full of contradictory experiences of pain and pleasure, heartache and love, fear and hope, and

sadness and joy. Our bodies are literally rearranged, torn apart, and drained while growing humans within our womb, birthing those humans, sustaining those lives, and nurturing those tiny people in the critical years of development. When we come out the other end, all mothers are fundamentally changed and it’s often difficult to see and feel who we once were. We then begin the journey of bringing back together the different parts of who we were and who we are now and rebuilding ourselves to be something new. For Black mothers, this transformation occurs while living through systemic racism and personal implicit bias all made worse during the current health crisis due to COVID 19. Our physical survival of the birthing process and living is what we are tasked with as humans. The ability to care for ourselves, to celebrate, and to commune with each other is what we need to thrive.

- (on monitor)
Alison Croney Moses (American, b. 1983)
Bintu Conté (Maninkan, b. 1985)
8.16 ***We Are Black Vessels*, 2021**
4 mins and 18 secs
Produced by **One Productions**
Music by **Naz Alakai**
Courtesy of the artists

To be filled with life is to step into the crosswalk of being seen and unseen, of life and death, of losing our laughter to ensure survival and wellness. Within and beyond this body, our joy, wellness, and black body, whole, becomes a revolution.
– Bintu Conté

Brought together by Alison, a group of Boston-based Black mothers connected to develop a trusting, empowering community centered around the journey of Black Motherhood. In June of 2021, Bintu Conté—one of the mothers and an embodiment practitioner—guided the group in creating a sacred space to process lived experiences and cultivate a practice for sustaining physical, emotional, and collective self-care. This video is an excerpt of their weekend retreat at the Loring Greenough House in the Jamaica Plain neighborhood of Boston, MA.

9. Spaces

In the US, at the midcentury, birth moved from the bedroom to the hospital room, with the majority of deliveries for the first time taking place in a medical setting. Labor and Delivery wards, and the associated medical interventions in birth, have improved outcomes for many birthing people and their infants. They have also been—and remain—contested sites, with maternal and infant health outcomes being exponentially worse for childbearing people of color. This is despite the fact that the US spends more than any other nation per capita on healthcare—although maternal and reproductive health remain underfunded, far from universal, and dependent on health-care access and location.

(on monitor)

Frani O’Toole (American, b. 1997)

Liyan Zhao (American, b. 1990)

Vaidehi Tikekar (Indian, b. 1996)

9.1 *Disability x Maternity, A Household User’s Manual for Young Mothers with Disability, 2020*

Manual and video

4 mins and 6 secs

Courtesy of the designer

“My name is Frani and my mom and I co-wrote a manual for mothers with acquired disabilities.” So begins the introduction to the *Maternity x Disability Household User’s Manual*. O’Toole’s mother had a stroke when O’Toole was eight months old and in her daughter’s telling, their shared household became a landscape of care, in a disabled as well as a maternal sense. It was one scenario wholly missed by public, architectural, and even rehabilitation discourse.

Now a designer, O’Toole drew on architectural placemaking tools to write a manual for newly disabled young mothers intended to be placed in the folder that patients receive upon discharge from a rehabilitation center. It offers first person home-based tactical design strategies for hemiplegics like O’Toole’s mother who might receive training on independent living but actually find themselves responsible for many types of care. The manual is divided into four parts: the floor, the drawers, the background, and the street.

9.2 *Ladies Home Journal, May 1958* **First published by Condé Nast in 1883**

In the May 1958 issue of *Ladies Home Journal*, among the usual representations of midcentury motherhood—gleaming appliances, cake recipes, and lipstick-wearing women in aprons—was a page with a letter penned by an anonymous labor and delivery nurse:

When I first started in my profession, I thought it would be wonderful to help bring new life into this world. I was and am still shocked at the manner in which a mother-to-be is rushed into the delivery room and strapped down with cuffs around her arms and legs and steel clamps over her shoulders and chest. It is common practice to take the mother right into the delivery room as soon as she is “prepared.” [This preparation would have meant shaved pubic hair and an enema.] Often she is strapped in the lithotomy position, legs in stirrups with knees pulled far apart, for as long as eight hours. On one occasion, an obstetrician informed the nurses on duty that he was going to a dinner and that they should slow up things. The young mother was taken into the delivery room and strapped down hand and foot with her legs tied together.

The letter touched a nerve. Women across the country wrote in to share their own stories of abuse and lack of consent, including being strapped down and drugged in an effort to keep them still, quiet, and passive.

**George Melville Wolff (American, 1898-1977)
Wolff and Phillips Architects, Portland, OR
9.3 Kaiser Permanente Sunset Boulevard Hospital
Maternity Ward, c. 1950
Courtesy of Kaiser Permanente Heritage
Resources**

Kaiser Permanente's "dream hospitals," the first of which was built on Los Angeles's Sunset Boulevard in 1952, promised efficient and thoughtful care to a generation of postwar birthing people. The architectural plan of the dream hospitals was built around concentric "circles of service" that separated sterile staff spaces from patients, and both of these from visitor access. The model was used at least a decade earlier at another Kaiser facility, the Portland Child Service Centers, built in 1943 for Kaiser's shipyard workers. There, a centralized play area was ringed by a main corridor from which six classroom hubs emanated. The architect, George Wolff, credited Richard Neutra, an Austrian émigré to California, and his "ring school" concept as inspiration in a 1944 interview for *Architectural Record*. (Kaiser, a geodesic dome fan, favored circular plans.)

Beside each birthing person's bed was a large metal filing-cabinet-like drawer that, when pulled open, transferred the baby's bassinet from its slot in the communal nursery to the privacy of their room, where they could bond and—the medical staff hoped—breastfeed, turning the tide against the prevailing trends of bottle-feeding and formula use. (Histories of the drawer make no mention of the uncomfortable twist and bend required to pick up the baby.)

The design was the brainchild of Dr. Sidney R. Garfield, a pediatrician and right-hand man of Henry J. Kaiser, the industrialist and multifaceted entrepreneur who founded Kaiser health care for his workers. Garfield and his colleagues had read of Yale professor Dr. Edith Jackson's recent project at Grace-New Haven Community Hospital, which encouraged bonding and breastfeeding through "rooming-in."

Tried between 1946 and 1952, the practice was welcomed by patients who rebelled against heavily sedated, intervention laden deliveries and separated lying-in. Jackson's

protocols encouraged unmedicated birth when possible, and placing the bassinet in the birthing person's room.

At the Los Angeles hospital, the "baby drawer" was one of many care contact points that Garfield and his colleagues had set out to reconfigure in service of what they deemed a more humane and efficient medical environment. Decentralized nursing stations enabled more responsive care, and individual bathrooms, hot and cold water, and ice in each room offered dignity.

10. Monitoring

What we choose to observe and monitor can reveal our greatest aspirations and deepest fears. In the twentieth century, designers harnessed science, technology, and the power of communication to create new ways of monitoring our bodies, as well as those of fetuses and babies. Forms of monitoring can be designed to empower individuals, families, and larger communities, but they can also negatively impact the way we perceive and react, magnify our anxieties, or compromise bodily autonomy and more intimate ways of knowing.

(on monitor)

- 10.1** *See How They Play, 2013*
Directed by Jonny Solomon
Written by Ruth Anne Hammond, Elizabeth Memel, and Carol Pinto
Courtesy of Resources for Infant Educators® (RIE®)
35 mins and 27 secs

(on monitor)

- 10.2** *On Their Own/With Our Help, 1978*
Directed by Penny Wright, Magda Gerber, and Thomas Forrest
Courtesy of Resources for Infant Educators® (RIE®)
13 mins and 43 secs

Dr. Emmi Pikler (Hungarian, 1902-84)

- 10.3** *Unfolding of Infants' Natural Gross Motor Development, 2006*

Dr. Emmi Pikler, a Hungarian pediatrician and creator of Lóczy, a facility established in 1948 to care for war orphans in Budapest, developed a series of principles that elevated caregiving, promoted children's free, self-initiated play, and emphasized the benefits of sensitive observation for caregivers and children alike. In 1978, Magda Gerber, a child development specialist and Hungarian-American émigré, developed a series of principles based on Pikler's work. Resources for Infant Educators® (RIE®), as the methodology is called, teaches caregivers to connect meaningfully with children during select caregiving acts (like feeding or diapering), to trust

in their self-initiated playful explorations, and to take time for themselves.

In these films, observation is a mutually beneficial form of monitoring—an unrushed, uninhibited, and meaningful opportunity for learning and connection. In a carefully prepared environment, adults sensitively observe children as they are given freedom to explore, initiate, play, learn, and problem-solve on their own with select adult intervention. By observing, caregivers can trust in a child's safety and competence. They can better understand children's needs, abilities, and ways of communicating, as well as enjoy the process of self-initiated learning as it unfolds. Such moments demonstrate the tremendous value of caregivers, and how crucial it is to support and compensate them fairly.

- 10.4** *Fisher-Price Nursery Monitor, 1983*
Fisher-Price (est. 1930, US)
Electronics with plastic casing

- 10.5** *Child View Monitor and Television, 2002*
Safety 1st (est. 1984, US)
Electronics with plastic casing

- Isamu Noguchi (American, 1904-1988)**
10.6 *Zenith Radio Nurse Advertisement, c. 1938*
Zenith Electronics, LLC (est. 1918, US)

On February 27, 1932, Charles Lindbergh Jr., the twenty-month-old son of aviators Anne Morrow Lindbergh and Charles Lindbergh, was taken

from his crib and carried out an upstairs window in his New Jersey home while his parents sat, unaware, by the living room fire. In the wake of this public tragedy, Eugene McDonald, president of the Zenith Radio Corporation, crafted a prototype monitor that would help ease the anxieties of his own growing family.

Using a microphone, speaker, and radio, McDonald fashioned a device that transported the sounds of the room where his newborn daughter slept to a portable speaker, enabling caregivers to listen in from any room. In 1937, McDonald tasked the Japanese American designer Isamu Noguchi with designing the device's casing. Noguchi called it "my only strictly industrial design" (he would later become known for bringing sculptural principles into daily life). The resulting Zenith Radio Nurse was a streamlined, anthropomorphic form whose figurative curves and interlocking shapes combined inspiration from a Japanese kendo mask and a nurse's wimple.

The baby monitor, though considered a luxury item well into the 1970s, was part of a major shift in the way adults care for babies. This sonic bridging of rooms did more than just change homes; it revolutionized the way we interpret babies' cries. Designed specifically to amplify cries, baby monitors helped to further the notion that a cry was a signal that must be noticed immediately and responded to promptly.

The packaging for baby monitors of the 1980s and 1990s showcases deeply gendered and racialized domestic fantasies, unleashing new forms of techno-babysitters into the modern home. These devices, as promised by their packages, offered (mostly White) mothers a chance to enjoy a quiet cup of tea in sparkling, clean kitchens. In the case of the Safety 1st video monitor, which doubles as a miniature television set, mom watches her baby sleep, while dad enjoys a football game on the exact same device.

10.7 Owlet Smart Sock, 2nd Generation, 2018
Owlet Baby Care (est. 2013, US)
Wearable synthetic sock with monitoring sensor
Courtesy of Rachel Swartz Robinson

10.8 Mimo Onesie, 2016
Rest Devices Inc. (est. 2011, Austria)
Cotton onesie that connects to an app on a smartphone (iOS and Android)

When the first patent for a breath monitoring device was filed in 1979, it was indicative of a

larger trend toward diagnostic monitoring that would gain momentum in the following decades. In the 1980s and 1990s, some monitors were sold with the intention of reducing sudden infant death syndrome (SIDS). Epidemiological studies show that these devices have no effect on the incidence of SIDS, this never has stopped marketers from making the suggestion. Today's generation of wearable, connected devices gathers data on everything from sleeping patterns and the position of babies (on their stomachs or backs) to breathing rates, skin temperature, room temperature, and even, in some cases, blood-oxygen levels and heart rates. The "internet of toddlers" now also includes smart onesies, diapers that detect urinary tract infections, and pacifiers that warn of elevated temperatures. Information can be constantly tracked via apps on a carer's smartphone.

Toni Weschler (American, 1955)
10.9 Fertility Awareness Method (FAM) Chart
from the book *Taking Charge of Your Fertility*,
originally published 1995
Photocopy of FAM chart, 2012
Courtesy of Amber Winick

Body literacy is the self-knowledge gained by learning to observe and chart the signs of fertility and infertility. People from every culture and epoch have created ways to help us visualize the inner workings of our bodies. Such designs help us to know ourselves deeply. And when we know our bodies, not only can we marvel at our own internal wisdom and capacities, but we can also make informed and empowered decisions.

In 1996, Toni Weschler published *Taking Charge of Your Fertility*, popularizing the Fertility Awareness Method (FAM) and ushering in a more nuanced and agile model of body literacy. Weschler sets out comprehensive explanations of the phases of the menstrual cycle and identifies the three primary signs of fertility: waking (basal body) temperature, cervical fluid, and cervical positioning. Beyond observing these signs, Weschler makes room for different cycle lengths and instructs readers in how to "chart" on ready-made templates. Throughout a monthly cycle, FAM followers are instructed to circle and link together thermal shifts to plot their preovulatory, fertile, and infertile phases.

10.10 Photograph of the first Disonograph, built at Kelvin & Hughes at Hillington, Glasgow, c. 1964

Dugald Cameron (Scottish, b. 1939)

10.11 Technical drawing of layout of Ultrasonic unit, 1:8 scale, April 1963

Courtesy of the Glasgow School of Art Archives, Scotland

Ultrasound machines were invented to spot German submarines during World War I. In the 1950s, Ian Donald, a professor of obstetrics and gynecology at the University of Glasgow, figured that “there is not much difference between a fetus in utero and a submarine at sea. It simply is a matter of refinement.” Donald, together with obstetrician John MacVicar and industrial engineer Tom Brown, built various prototypes for obstetric ultrasound scanners.

In 1961, a twenty-three-year-old industrial design graduate of the Glasgow School of Art, Dugald Cameron, streamlined the apparatus. Cameron had been recruited to figure out the problem of patient and physician comfort after the University Hospital in Lund, Sweden, placed an order based on an early version of the scanner developed by Donald and his colleagues. Cameron recalled needing to do some serious revision, given the menacing aspect of the prototype:

I thought it looked like a gun turret and that it was thoroughly inappropriate for pregnant ladies [W]hat we thought we ought to do was to separate out the patient, the doctor, and the machine and try and put these three things in a better ergonomic relationship with one another. That was the first drawing which I had been commissioned to do, and for which I received an order for £21.

Oral histories of the midwives and expectant people who experienced the first obstetric ultrasounds performed by Dugald and his colleagues in Glasgow hospitals between 1963 and 1968 relay the wonder and delight of staff and patients alike. Pat Anusas, a young midwife who worked at the Queen Mother’s Hospital recalls watching one of the early scans: “I still to this day can’t believe what I saw ... didn’t know if it was going to work or not—but it did work. And both the mother and I were so excited—she couldn’t believe she could see her baby.”

**10.12 Dilation Chart, c. 2021
Wood**

Cervical dilation charts demonstrate how in preparation for birth one’s cervix effaces (thins and stretches) and dilates (opens) so a baby can fit through the birth canal. This cervical ripening can begin days or weeks before one’s due date. In cases of vaginal birth, once the cervix opens to ten centimeters, the person is ready to push and birth their baby.

Yet, when it comes to childbirth, such rationalized standards for measurement are not always useful. While cervical dilation checks have become a standardized aspect of medicalized childbirth, many midwives, doulas, and forward thinking obstetricians and birth advocates insist that cervical dilation does not predict the timeline, speed, or cadence of birth. Counter to what cervical dilation charts may suggest, cervixes do not follow timelines or standard metrics; dilation does not predict when one goes into labor, or even how long labor will last. And while inductions are certainly sometimes called for, some providers use cervical checks as an argument for induction (“failure to progress” as it’s often—frustratingly and imprecisely—called).

**10.13 ECG Toco Fetal Chart Paper
Vivid Medical Source (est. 2012, US)
152mm x 47’ Corometrics Model 120 170
Monitor**

**10.14 Mrs. Connie Fleischner, seven and a half months pregnant, holding the output from an EKG-500 “medical telemetering unit” in Chicago, 1962
Courtesy of the Cleveland Press Archives**

An electronic fetal monitor (EFM) records a fetal heartbeat in utero along with the birthing person’s contractions to ensure that fetal oxygen supply is adequate. While the type of monitor and its deployment varies, continuous electronic monitoring during labor is now one of the most widely experienced obstetric interventions. The practice of EFM was widely introduced to hospitals in the 1960s and 1970s without robust evidence of its efficacy from clinical trials. Yet the embrace of the technology was swift. According to the American College of Obstetricians and Gynecologists, EFM was used for 45 percent of laboring women in 1980, 62 percent in 1988, 74 percent in 1992, and 85 percent in 2002. Today the use of EFM during labor is around 90

percent. Changes in fetal heart rate often prompt a cascade of medical interventions, especially in pregnancies deemed high risk. Such interventions range from limiting the ability of the birthing person to move freely during labor, to an increase in the use of forceps and Cesarean births. In 2015 the *New Republic* called EFM machines both “the most common childbirth practice in America” and “unnecessary and dangerous.”

The World Health Organization explains that “experience of care is as important as clinical care provision in achieving the desired person-centred outcomes,” and that “continuous cardiotocography is not recommended for assessment of fetal wellbeing in healthy pregnant women undergoing spontaneous labour.”

The view that EFM has no positive effect on infant or maternal outcomes in birth has been clearly articulated in contemporary scientific and medical literature. Yet these machines still crowd labor and delivery wards, especially in the litigious United States, where overuse of medical intervention clouds many health-care scenarios. A printout of heart rate and contractions provides a literal paper trail for medical professionals who fear malpractice suits.

Designs for EFMs are ubiquitous, and will not soon disappear. But the increasing awareness of their potential to lead to unnecessary interventions in some birth scenarios calls to mind the Hippocratic oath’s caution that medical providers “first do no harm”—and reminds us that designers, especially in the medical field, should be guided by the same principle. This starts with the informed consent of birthing people, including advising them that in many cases strapping EFM sensors to their belly, rather than reducing complications, increases risk.

10.15 The Rule of Life Scientific Menstrual Guide, c. 1930s

**10.16 The Forecaster, 1948
Manufactured by Forecaster Co.**

**10.17 Ovulation Strips, 2021
Pregmate LLC (est. 2014, US)
Plastic**

Designers began exploring methods to detect ovulation as early as the 1960s, but it wasn’t until the mid-1980s that over-the-counter ovulation monitors became widely available. Since then, monitors, strips, and tests have been sold to measure the level of Luteinizing Hormone (LH) in

one’s urine at home. LH is one of the hormones produced by the pituitary gland. Secreted at very low levels throughout the menstrual cycle, once a developing egg follicle reaches a certain size then LH secretion surges and triggers ovulation about twenty-four to forty-eight hours later. A positive result from an ovulation kit such as this one indicates the presence of a high amount of Luteinizing Hormone or LH surge, initiating the beginning of ovulation.

**10.18 Dr. Maria Hengstberger (Austria, 1941)
CycleBeads®, 2002
Cycle Technologies (est. 2002, Austria)
Rubber and plastic**

Using a standard twenty-eight-day menstrual cycle as the basis for her design, the Austrian gynecologist Dr. Maria Hengstberger developed the Baby Necklace in 1989. Having relocated to Ethiopia to set up a local clinic, Hengstberger worked closely with local women to design this and many other reproductive knowledge tools, including a necklace of color-coded beads to help people monitor their cycles. This necklace was instrumental in the later development of CycleBeads and its “Standard Days Method,” a design that helps people identify their potentially fertile windows.

**Pascal Koenig (Swiss, active 21st century)
Philipp Tholen (Swiss, active 21st century)
Peter Stein (Swiss, active 21st century)
Lea von Bidder (Swiss, active 21st century)
10.19 Ava Bracelet, 2014
Wearable technology housed in biocompatible silicone
Courtesy of Ava**

Ava, the startup behind the world’s first fertility tracking bracelet, was launched in Zurich in 2014. While many other period-trackers like Clue (founded in Berlin), Daisy (founded in Switzerland), Natural Cycles (founded in Sweden) and Groove, Glow, Kindara and Ovia (all founded in the US) have developed apps to track fertile days in a menstrual cycle, Ava uses wearable technology to inform its mobile tracking.

While not cheap (the basic model is \$259), its blank-faced watch-like wristband can be worn at night to monitor nine indicators of fertility (resting pulse rate, sleep, breathing rate, perfusion, movement, heat loss, skin

temperature, bioimpedance and heart rate variability). This allows its app to pinpoint the 5.3 most fertile days of a wearer's cycle. Ava's approach has been validated in a study published in *Scientific Reports* (a journal from the publishers of *Nature*). Data collected from the bracelet is displayed on an app, and intended to help people manage their reproductive health including fertility tracking, conception, and general health tracking during pregnancy. The company reports that it has helped over sixteen thousand people conceive.

Dr. Hubertus Rechberg (German, 1948-2019)
Dr. Werner Steinschulte (German, active 20th century)
Natalie Rechberg (German, b. 1980)
Niklas Nathe (German, b. 1985)
Herman Ramsauer (German, b. 1964)
Klaus Puchinger (German, b. 1965)
Therese Naef Milani (Swiss, b. 1971)
Britta Pukall (Swiss, b. 1965)
10.20 BABY-COMP®1.0, 1986
AEG Berlin and Valley Electronics (est. 1986, Germany)

In 1983 German businessman, Dr. Hubertus Rechberg, laid the foundation for a series of fertility trackers when he and his wife searched for alternatives to hormonal contraception. His computational design for cycle tracking combined a thermometer with a computer and software. Users simply measured their basal body temperature under their tongue with the device in the morning, immediately after waking up and before getting up. Three years later, Dr. Rechberg founded Valley Electronics GmbH and launched the world's first fertility tracker: the Baby-Comp. The company's products have been continuously developed, with Dr. Rechberg's daughter, Natalie, working with an all-female Swiss design team to create the Daysy 1.0 (2014) and Daysy 2.0 (2019), the latter of which incorporates a smartphone app. These designs allow users to make informed choices about their menstrual cycle, their fertility, and their body.

Glossary

Birthing, pregnant, or postpartum person

In popular and professional discourse, the language of reproductive health—including pregnancy, birth, and the postpartum period—is gendered in ways that do not encompass the full spectrum of human experience. In this exhibition, we use “person” to describe someone experiencing pregnancy, birth, or the postpartum period. The word embraces transgender, intersex, genderqueer, and nonbinary people.

Childfree

“Childfree” simply denotes “without children.” This neutral term contrasts with “childless,” which implies a thwarted desire to procreate. Childfree is often followed by the qualifier “by choice” or “by circumstance,” the former denoting deliberate agency and the latter reflecting a circumstance that would make having a child a risky proposition. While the term emerged from second-wave feminist consciousness-raising and access to increasingly reliable forms of contraception, it was women of color forming the vocabulary of the reproductive justice movement who recognized that social and cultural factors determine who gets to procreate, and how.

Inadequate terminology

Human reproduction is one of the most widely experienced phenomena, and it occurs at many different paces and in deeply personal ways. Let’s leave outdated descriptors to history. Cervixes are not incompetent, pregnant people over the age of 35 are not geriatric, and no pregnant person “fails to progress.” And whether it is vaginal, by Cesarean, at home, in a hospital, in a pool, or with an analgesic IV drip, it’s all birth.

Medical racism

Medical racism is the systematic and wide-spread discrimination against people of color within the medical system. Whether conscious and unconscious, medical racism encompasses the disparity in health care by race and the biases held by healthcare workers against Black and Brown people’s care.

Midwife, doula, and birth companion

A midwife is a trained professional who cares for pregnant, birthing, and postpartum people, guiding them through childbirth. A doula (or attendant) provides support for a spectrum of reproductive experiences and outcomes—from conception and contraception, birth to abortion, miscarriage, medical termination, stillbirth, surrogacy, and adoption. A birth companion is a trusted person who provides advocacy for a laboring person.

Motherhood

Motherhood is shorthand for acts that go beyond a gender binary and beyond people who have been pregnant or given birth. It is a descriptor that can be embodied, deferred, refused, taken on as a duty or expectation, or otherwise engaged with, in all its knotty contours. Motherhood is myriad.

Pregnancy loss

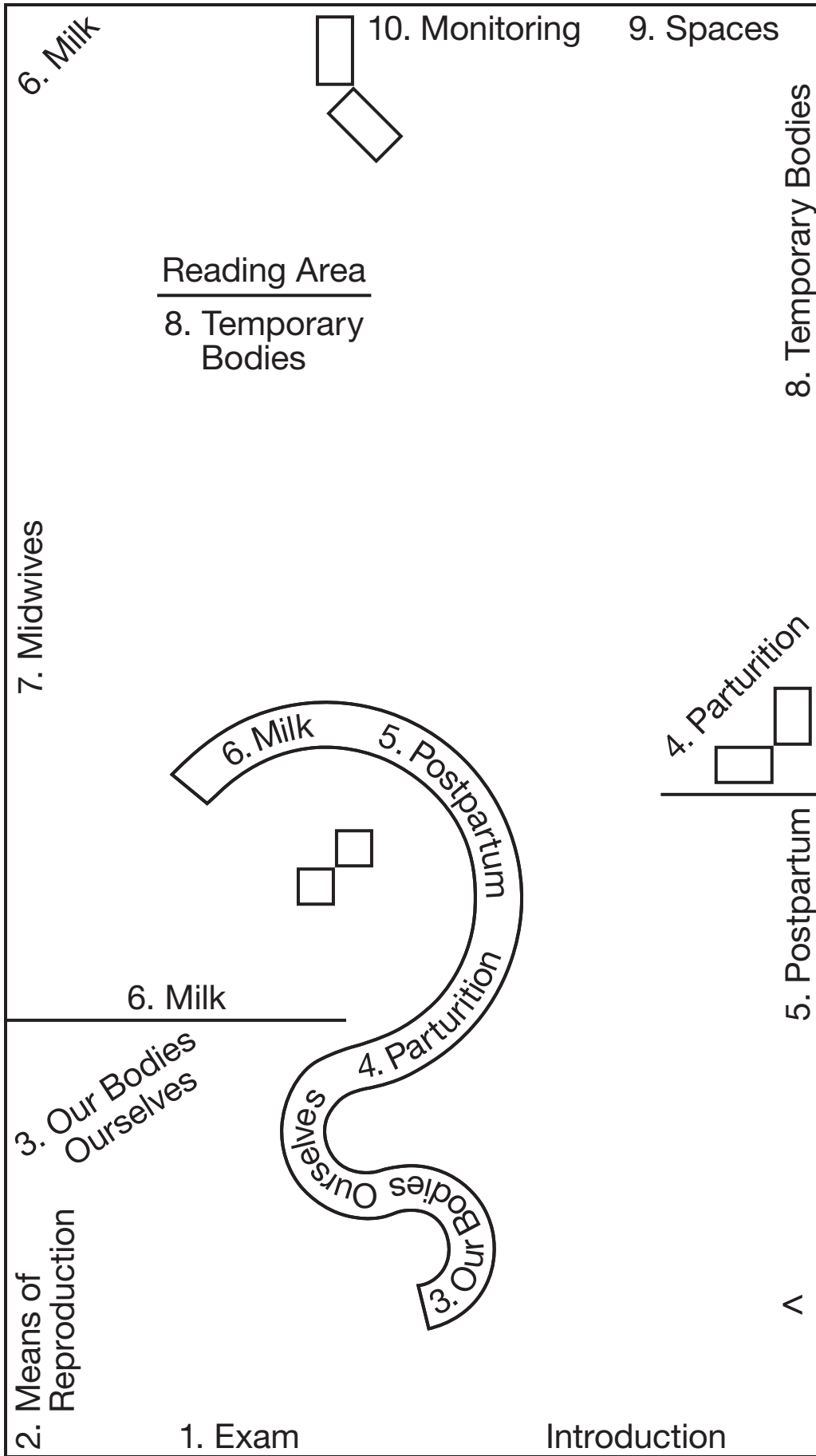
Pregnancy loss means miscarriage before the twentieth week of gestation, and is considered a stillbirth after that. Despite these objective definitions, every experience is unique. Loss of pregnancy can come with searing physical or emotional pain, disappointment, guilt, shame, or relief, compounded by the fact that pregnancy loss is often a cultural taboo.

Reproductive justice

Reproductive justice is the human right to maintain personal bodily autonomy, have children, not have children, and parent the children we have in safe and sustainable communities. Its definition was pioneered by a group, Women of African Descent for Reproductive Justice, in 1994, building on the work of Indigenous women, women of color, and trans* people.

Trauma-informed care

Trauma-informed care is defined as practices that promote a culture of safety, empowerment, and healing. This care aims to avoid circumstances that embarrass, insult, or harm patients who may otherwise avoid medical care due to past negative experiences.



6. Milk

10. Monitoring

9. Spaces

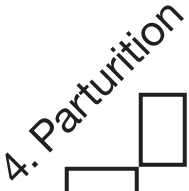
Reading Area

8. Temporary Bodies

8. Temporary Bodies

RESTROOMS + ELEVATORS

7. Midwives



5. Postpartum

6. Milk

BARKAN BIG IDEAS STUDIO

3. Our Bodies Ourselves

< ENTER + EXIT >

2. Means of Reproduction

1. Exam

Introduction