

Breast Pumps: Tips for Use and Evaluating Effectiveness

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Objectives

- ▶ Participants will be able to:
 - ▶ explain at least two situations for which rental (“hospital-grade”) pumps are usually the most appropriate choice.
 - ▶ list at least two characteristics of effective retail pumps.

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Disclaimers

In my private practice:

1. I rent Medela and Ameda breast pumps.
2. I sell pump parts made by Medela, Ameda and Pumpin’ Pal.

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- ▶ All pumping parents want to:
 - ▶ Drain the breast well
 - ▶ In the least amount of time
 - ▶ Not get sore

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- ▶ Most parents need to choose a pump made for the situation they are in.
- ▶ Most retail pumps made for parents employed full-time.
 - ▶ 3-4x/day pumping
 - ▶ Baby at breast morning, evenings, nights weekends
 - ▶ *NOT* meant for exclusive pumping

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- ▶ Parents using retail pump
 - ▶ Exclusive pumping
 - ▶ Pumping after feeding when baby feeding ineffectively
OFTEN DON'T MAKE ENOUGH MILK
- ▶ Suggest parent try rental pump before trying galactogogues
- ▶ Some parents need rental pump for employment or school

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- ▶ Some parents react to noise of electric pump.
- ▶ Manual pumps don't make much noise; much cheaper.
- ▶ To save time, use two *one-handed* manual pumps at the same time.

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- ▶ Basic explanations are important
- ▶ How to use a pump may not be obvious to parent who recently delivered their baby or who is sleep deprived
- ▶ Wording is important: "8x/24 hours", not "8x/day"

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- ▶ If parent has plenty of milk but baby does not feed well, or parent and baby are separated, pump 2-3 minutes past the point when parent thinks they are done.
- ▶ If trying to build milk supply, pump 15 minutes if baby did not come to breast; pump 10 minutes if parent heard baby do a fair amount of swallowing at breast.

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- ▶ "New-Parent Brain"
 - ▶ State the obvious
 - ▶ Don't pump before feedings

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- ▶ If baby has not come to breast yet, suggest parent use pump on low setting the first few times
 - ▶ Gradually set suction higher with subsequent pumpings over 24-48 hrs.
- ▶ If baby has already come to breast, parent can just pump normally

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- ▶ Most pumps need to create at least 200mmHg suction.
- ▶ Also check that pump's suction level is not going too high (300mmHg +). Some parents can't tolerate more than 250mmHg.

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Evaluating Pumps: Unfamiliar pump

- ▶ Look at manufacturer's website
 - ▶ Look for link to "Technical Specifications" or "User's Instructions"
 - ▶ If nothing helpful online, call Customer Service. May need to ask for Technical Service Department.
 - ▶ If you don't know the website, google the name of the *pump* and you can usually find the manufacturer's website.

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Does pump allow for variation in nipple size?

- ▶ Most companies have a "standard" size flange they put in the pump box.
 - ▶ Do they have additional sizes that can be purchased separately?
 - ▶ How many different sizes do they make?
- ▶ Some put in more than one size.
- ▶ Some make their pump compatible with Pumpin' Pal flanges.

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How many *effective* sucks/minute?

- ▶ Should generally be able to produce at least 48/minute.
- ▶ Maximum number is usually between 80-100/minute.
- ▶ 55-60/minute is generally considered to mimic what baby does during letdown ("expression phase")
 - ▶ "Stimulation" phase is faster, to trigger letdown.
- ▶ Is suction level tied to sucks/minute (pre-set) or can parent set them independently?

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Suction levels

- ▶ Is "high" suction level at least -200mm Hg?
- ▶ Medela study years ago showed baby could create -250 to -260mm Hg.
- ▶ Some pumps now go above -300mm Hg.

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Checking a pump's suction

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How to check suction

- ▶ Medela Symphony has separate sides, though both have to be at the same suction level and sucks/minute.
 - ▶ Must test each side independently.
- ▶ All other pumps I have tested have a "united" system where the two sides work together and if you set one side down, no suction on the other side. Must physically close off side parent doesn't want to use.

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How to check suction

- ▶ Pumps have to work harder when double-pumping (except Symphony), so test suction with pump assembled for double-pumping.
- ▶ Push suction gauge into one side (24mm or 25mm flange).
- ▶ Close off other side with 7/8 inch (22-23mm) rubber stopper.

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How to check suction

- ▶ Record the low and high suction level settings.
- ▶ When fewer sucks/minute, watch suction gauge to see if more time spent with no suction (space between sucks), or if suck climbs to high more slowly, or zooms to high quickly and holds at high point.
 - ▶ If fewer sucks/minute and pause occurs while suction is high, potential for nipple damage.

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How to check suction

- ▶ When testing suction on a double pump, test when double-pumping and when single-pumping.
 - ▶ Does suction go too high when single-pumping, or stay in a safe range?

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Evaluating pumps

- ▶ What situation(s) does manufacturer suggest its pump is best for?

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“Hacking” pump parts

- ▶ Pump manufacturers create their collection kit so that all parts work together to create the specified suction level(s).
- ▶ When parents start to “mix and match”, there is risk of changing pump’s performance.

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“Hacking” pump parts

- ▶ Putting different brands of pump parts on a pump voids its warranty (unless manufacturer specifically states otherwise).
- ▶ Pump manufacturer cannot be held liable for damages if parent has hacked the pump parts and gets harmed.
- ▶ You need to be careful about suggesting to parents that they hack pump parts.

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Types of pumps

- ▶ FDA has stated “hospital-grade” has no meaning. Ameda no longer uses the term in its Retail and Rental Price List, but Medela still does.
- ▶ Ameda uses term “multi-user”. ****BUT**** it does not call its Purely Yours pump “multi-user” even though it uses the same collection kit that the FDA has verified as protecting mothers from the germs of other mothers.
- ▶ We KNOW a Purely Yours does not provide the same stimulation as a Platinum, even though technically both pumps *could* be called “multi-user”.

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Types of pumps

- ▶ When parents are exclusively pumping, or combining at-breast feeding with pumping for a baby who isn't breastfeeding well, many need a heavy-duty rental pump to stimulate and maintain a sufficient supply.
 - ▶ (The created suck may be smoother or more consistent??)

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Types of pumps

- ▶ Retail double-sided pumps
 - ▶ Usually meant for only one parent to use, even if the collection kit is a closed system.
 - ▶ Often doesn't have the motor strength of the pumps we previously called “hospital-grade.”
 - ▶ Most parents need to pump frequently and need to get done, so I'm not considering single-sided *electric* retail pumps in this presentation.

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Types of pumps

- ▶ Retail double-sided pumps
 - ▶ Can parent adjust suction level and sucks/minute independently?
 - ▶ What is the suction range the pump can produce?
 - ▶ How many sucks/minute?
 - ▶ Does it work as well with battery as when plugged into outlet?
 - ▶ Are flanges available in numerous sizes?

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Types of pumps—manual pumps

- ▶ Some parents do not like the feel or sound of electric pumps.
- ▶ If parent chooses one-handed manual pump, they can still double-pump (assuming they do not do hands-on pumping).
- ▶ How many flange sizes are available?
- ▶ What is the highest suction level the pump can produce?

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▶ SPECIFIC PUMP BRANDS/MODELS

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True “Hospital-grade” or rental pumps

- ▶ Medela Symphony
 - ▶ Two cycles: Stimulation and Expression
 - ▶ Can control suction level, but # of sucks/minute is determined by suction level.

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True “Hospital-Grade” or rental pumps

- ▶ Medela Symphony (cont.)
 - ▶ Plus version (previously called Preemie+) contains program card with two programs, one pre-programmed with 15 minutes of a sequence of various stimulation, expression and pause phases; and one with the two-minute Stimulation phase automatically switching to Expression phase. (For use by mothers of newborns whose baby is not coming to breast.)
 - ▶ Vacuum ranges from 50 to 260mm Hg (though I rarely see a Symphony registering higher than 240mm Hg).

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True “Hospital-Grade” or rental pumps

- ▶ Medela Symphony (cont.)
 - ▶ Suction of Symphony “bounces” at high. Goes up to 220 to 240, then comes down to 200 with a very slight pause, then drops to zero to complete the cycle.
 - ▶ Medela offers 5 sizes of round, hard-sided flanges: 21mm, 24mm, 27mm, 30mm, 36mm. Pumpin’ Pals fit in its central connector. (Medela does not suggest them.)
 - ▶ Medela also offers 4 sizes of oval, silicone-edged hard flanges: 21mm, 24mm, 27mm, and 36mm. (NEW, called “Flex” shields)

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True “Hospital-Grade” or rental pumps

Ameda Platinum
Lightweight plastic housing, but has metal piston to create suction.

Parent has control of suction level and cycle speed independently.

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True “Hospital-Grade” or rental pumps

- ▶ Ameda Platinum
 - ▶ Has three windows on the front
 - ▶ Speed display (30-80 cycles/minute); Suction level, displayed as 1-100% of possible suction the pump can create (30 to 250mm Hg); timer display (up to 60 minutes).

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True “Hospital-Grade” or rental pumps

- ▶ Ameda Platinum (cont.)
 - ▶ Ameda offers 7 sizes of flanges **for the Platinum pump**: 19mm soft insert; 21mm hard insert; 25mm hard flange; 30.5mm hard flange with 28.5mm hard insert*; 36mm flange with 32.5mm hard insert
 - ▶ *Separate 28.5mm flanges are offered, but sterile-wrapped and more expensive—meant for hospitals more than retail sellers.
 - ▶ Pumpin’ Pal can be shoved into the opening of the 25mm flange. (Ameda does not suggest them.)

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True "Hospital-Grade" or rental pumps

- ▶ Ardo Calypso Pro (information from their website)
- ▶ "The Calypso Pro (multi-user) is designed for loaner and rental programs with increased durability and warranty compared to single-user Calypso. Features independent vacuum and cycle adjustment - 64 total settings. 'Vacuum Seal' technology (when used with Ardo pumpset) creates a closed system -- no milk in the tubes or pump. AA Battery function for operation away from electric power." (as accessed March 30, 2019.)

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Manual pumps

Medela Harmony

One-handed manual pump

Flanges can be changed for best size; all Medela flanges will fit in it.

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Manual pumps

- ▶ Medela Harmony (cont.)
 - ▶ Thumb on top of handle creates quick, shallow sucks.
 - ▶ Fingers on lower part of handle create slower, deeper sucks.

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Manual pumps

- ▶ Avent manual pump
- ▶ One-handed manual pump
- ▶ The only way to change size of flange is to remove the petal cushion insert.

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Manual pumps

- ▶ Ameda One-Handed
 - ▶ Flange size can be changed by switching to larger flanges or using inserts. (Uses same flanges as Platinum pump.)
 - ▶ Can be difficult to control suction level.
 - ▶ Ameda says it won't cause or irritate carpal tunnel syndrome, but mothers say it does.

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Manual pumps

- ▶ Haakaa and Zerlar
 - ▶ Flexible silicone pump.
 - ▶ Haakaa now comes in Gen. 3 version, which has detachable silicone bottle.
 - ▶ Zerlar is softer, more flexible than Haakaa.

Haakaa Gen 3

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Manual pumps

- ▶ Haakaa and Zerlar
 - ▶ Parent squeezes body of pump and places it against the breast, then lets go. The suction will keep the pump in place against the breast.
 - ▶ Some “pumping” can happen if parent keeps taking pump off breast and re-attaching it.

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Manual pumps

- ▶ Freemie Equality Double Manual Pump
 - ▶ Can use one hand to pump both breasts at the same time.
 - ▶ The collection cups for these are NOT the same as for Freemie Liberty and Independence pumps.

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RETAIL ELECTRIC PUMPS

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PJ's Breast Pumps

Limerick is a WHO Code Compliant company.

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PJ's Breast Pumps are:

- Small and lightweight (1.5 lbs.)
- Closed system
- Soft, flexible silicone breast shields, one size designed to fit all mothers
- Uses both suction and compression
- Built in Timer

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PJ's Comfort	PJ's Bliss
Hospital-grade*	Insurance-grade
More quiet	Less quiet
3-year warranty	1-year warranty
Covered by health insurance if baby is hospitalized and separated from mother	Covered by health insurance

*Evaluation of Milk Production with a Multi-User, Electric Double Pump with a Soft Flange in Mothers of VLBW NICU Infants
Research on effectiveness of PJ's Comfort Breast Pump presented at The Academy of Breastfeeding Medicine Annual Meeting Nov 2011, Nancy Wight MD et al.

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Some Specs:

- Vacuum and cycle adjust "separately"
- Move from let-down mode to expression mode manually
- Suction levels reach 250mmHg

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Retail Pumps

- ▶ Bellababy
 - ▶ Relatively inexpensive
 - ▶ WHO Code violator, though nipples aren't shown in Amazon listing
 - ▶ No place to purchase spare parts
 - ▶ Pump does NOT plug into wall socket; only has USB port connector
 - ▶ Comes with 10 storage bags, no info on where to buy more

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Retail pumps

- ▶ Bellababy (cont.)
 - ▶ Complicated pump, with FOUR suck style modes
 - ▶ Massage Mode—Level 1: ZERO suction, though making a sucking noise, 90 "sucks"/minute (spm), through Level 6: 110-120mmHg suction, 47 spm when double-pumping
 - ▶ Continuous Suck Mode—Level 1: 140-210mmHg suction, 24 spm to Level L6: 280-375 mmHg suction, 13 spm when double pumping.

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Retail pumps

- ▶ Bellababy (cont.)
 - ▶ Frequency Conversion mode, which is a combination of 3 shallow sucks and 1 longer/stronger suck, so four sucks/cycle—L1: 0-110mmHg, 18 suck "sets"/minute to L9: 120-260mmHg suction, 7 suck "sets"/minute when double pumping
 - ▶ Normal Suck mode—L1: 80mmHg, 58 spm to L9: 270mmHg, 25 spm when double pumping.
 - ▶ All numbers are different and usually significantly higher for single-pumping. (Though pump only goes to 380mmHg.)

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Retail pumps

- ▶ Willow
 - ▶ Completely wearable under clothing
 - ▶ No parts to hold, put in your pocket or set on a counter. Pump fits in your bra, though might need a larger bra

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Retail pumps

- ▶ Willow
 - ▶ Only two flange sizes available: 24mm and 27mm.
 - ▶ Collection bags fit inside the pump.
 - ▶ Sold as two pumps to a box, so really a double pump.

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Retail pumps

- ▶ Medela Pump In Style Advanced
 - ▶ Suck feel was like Symphony when it had 12v motor. Changed to 9v motor in 2009. Parents started complaining of discomfort and more had trouble maintaining supply.

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Retail pumps

- ▶ Medela Pump In Style Advanced (cont.)
 - ▶ Max. suction 200 to 220mm Hg
 - ▶ Like Symphony, there is a split-second hold at 200mm Hg before dropping to 0.

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Retail pumps

- ▶ Medela Freestyle
 - ▶ Company info says maximum suction level is 270mm Hg but I've never seen it go above 240, and in recent years, not above 220.

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Retail pumps

- ▶ Medela Freestyle (cont.)
 - ▶ Has Stimulation and Expression modes.
 - ▶ 9 pre-set suction level settings, with cycles/minute tied to the suction level—not independent.

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Retail pumps

- ▶ Medela Freestyle (cont.)
 - ▶ Initial info was that it would have suck feel like Pump In Style Advanced but hands-free and not tied to a wall outlet. However, suction builds VERY slowly, then drops like a rock with no pause at the top of the cycle.
 - ▶ Many parents report trouble maintaining supply past 6-9 months.

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Retail pumps

- ▶ Medela Sonata
 - ▶ Information from www.medelasonata.com
 - ▶ Manufacturer says quiet, "hospital performance".
 - ▶ Not for initiating supply!
 - ▶ Connects through Bluetooth to parent's phone; can store pumping information.

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Retail pumps

- ▶ Medela Sonata (cont.)
 - ▶ Two Phases:
 - ▶ Stimulation and Expression
 - ▶ Expression Phase has two Rhythms
 - ▶ Signature and Lifestyle
 - ▶ Comes with 24mm and 27mm flanges; all Medela flanges will fit.

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Retail pumps

- ▶ Ameda Purely Yours/Purely Yours Ultra
 - ▶ Has been discontinued, but you may still see it.
 - ▶ Originally equivalent to Medela's Pump In Style Advanced in effectiveness, though some parents preferred its suck feel.
 - ▶ Suction level and sucks/minute independently adjustable.

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Retail pumps

- ▶ Ameda Purely Yours/Purely Yours Ultra
 - ▶ Can use same 7 flange sizes as Platinum rental pump.
 - ▶ Maximum suction level *was* 200 to 240mm Hg, but now I rarely see it go above 180. Many mothers report trouble with supply.

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Retail pumps

- ▶ Ameda Finesse
 - ▶ This pump is also being phased out. Expected to be unavailable by September or October 2019.
 - ▶ Uses same collection kit and 7 flange sizes as the rental Platinum and retail Purely Yours Ultra and Purely Yours pumps.

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Retail pumps

- ▶ Ameda Mya
- ▶ Ameda's newest pump, introduced in March 2019
 - ▶ 3 versions, but same pump; differences in bag and how many sizes of flanges are in package

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Retail pumps

- ▶ Ameda Mya (cont.)
 - ▶ Does NOT use same collection kit as Platinum. New kit is more like Spectra kit, but Ameda says not interchangeable with Spectra.

Ameda Mya Model 102A01
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Retail pumps

- ▶ Ameda Mya (cont.)
 - ▶ Flange sizes are 24mm, 28mm and 30mm.
 - ▶ 24mm packed in all versions, 24mm + 28mm in 102A03 version, 30mm must always be purchased separately
 - ▶ Parents can single pump or double pump.

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Retail pumps

- ▶ Ameda Mya (cont.)
 - ▶ Suction level goes up to 280mmHg.
 - ▶ 5 suction levels in Stimulation mode
 - ▶ 10 suction levels in Expression mode
 - ▶ This pump has a memory, which could lead to the same problems as the Spectra memory.

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Retail pumps

- ▶ Spectra S1, S2
 - ▶ Company considers these “hospital grade” personal pumps. “Mothers like these because they have a night light.”
 - ▶ S1 has a rechargeable battery; S2 must plug into outlet
 - ▶ Suction level range: up to 250mmHg when double-pumping, up to 280mmHg when single-pumping

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Retail pumps

- ▶ Spectra S1 and S2:
 - ▶ “Massage mode” used to first letdown: 70 cycles/minute (not adjustable); 5 suction level settings (up to -250mm Hg)
 - ▶ Parent then switches pump to “Expression mode”: 36-54 cycles/minute, independent of suction level (12 settings for suction level)

****HOWEVER:**** These pumps “remember” the last setting. So, beyond the initial use of the pump, they always turn on in **EXPRESSION MODE** and parents don't realize that. This causes significant trouble

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Retail pumps

- ▶ Spectra
 - ▶ 24mm and 28mm flanges in package
 - ▶ Per Spectra representative:
 - ▶ Maymom's 19mm and 21mm flanges are compatible with Spectra
 - ▶ Can get a yellow adapter or white backflow protector with longer stem from Maymom, that allows Medela flanges to work with Spectra.

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Retail pumps

- ▶ Spectra 9 Plus
 - ▶ This is insurance-provided pump.
 - ▶ For “personal use”, defined as occasional use, 1-2x/day.
 - ▶ Not for employment use, though some insurance companies offer this pump for employment.
 - ▶ Speed and suction are pre-set together.
 - ▶ Only comes with 24mm flanges.

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Retail pumps

- ▶ Hygeia Enjoye
 - ▶ “Hospital-grade” but considered “personal” pump, not rental.
 - ▶ Only one version now available, with internal rechargeable battery.

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Retail pumps

- ▶ Hygeia Enjoye (cont.)
 - ▶ Suction levels from 40 to 270mm Hg with infinite settings. (Parent controls.)
 - ▶ 30-65 cycles/minute, independent from suction levels.

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Retail pumps

- ▶ Hygeia Enjoye (cont.)
 - ▶ 27mm flange comes with pump. 29mm and 31mm must be ordered from company. Company tells mothers Pumpin’ Pal flanges fit in their pump. (Can be inserted into central connector instead of a Hygeia flange.)
 - ▶ Entire collection kit is interchangeable with Medela’s Pump In Style Advanced collection kit.

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Retail pumps

- ▶ Ardo Calypso
 - ▶ Manufacturer says Ardo collection kit works on the Ameda pump, but Ameda kit does not work as well on the Ardo pump.
 - ▶ Has 8 suction levels and 8 sucks/minute settings, for 64 possible pumping settings.

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Retail pumps

- ▶ Ardo Calypso (cont.)
 - ▶ Sucks/minute should be 30-60. I got that with batteries and wall outlet, single and double pumping.
 - ▶ **CONCERN:** When using the pump at lower sucks/minute, the pump holds the pause between sucks at the highest point of suction instead of at no suction.

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Retail pumps

- ▶ Ardo Calypso (cont.)
 - ▶ When checking suction levels using batteries vs plugged into the wall, the suction was actually higher with batteries. (unusual)
 - ▶ Suction was higher with single pumping than double pumping, as expected

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Retail pumps

- ▶ Ardo Calypso (cont.)
- ▶ Ardo makes 26mm flanges, 36mm flanges, 26mm massage inserts that fit into the 36mm flanges and 28mm hard inserts for the 36mm flanges. They also make 22mm inserts for the 26mm flanges, and 31mm flanges that are not in the package. Different packaging options include different sets of sizes. Sizes not in the box can be ordered separately from the company.

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Retail pumps

- ▶ Freemie Freedom electric pump
 - ▶ Adjustable dial for suction level, but you can't change sucks/minute.
- ▶ The collection cups for these are NOT the same as for Freemie Liberty and Independence pumps.

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Retail pumps

- ▶ Freemie Liberty electric portable pump
 - ▶ LCD display, shows pump settings/battery %age on backlit screen
 - ▶ Adjustable auto-shutoff timer can be set in 5-minute increments up to 40 minutes
 - ▶ Up to 280mmHg suction; Turbo mode is a long draw cycle
 - ▶ Shuts off automatically after 40 minutes
 - ▶ Co-branded with NUK as Simply Natural Double Pump

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Retail pumps

- ▶ Freemie Independence electric portable pump
 - ▶ LED light display shows pump settings through lit indicators
 - ▶ Up to 280mmHg suction; Turbo mode is a long draw cycle
 - ▶ Does not have adjustable shutoff timer, but shuts off automatically after 40 minutes

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Retail pumps

- ▶ Freemie collection cups
 - ▶ If you just want the collection cups to use with your own pump, you must order off the website because different cups work with different brands. Won't work with Medela Freestyle or Medela Swing.
 - ▶ Nipple openings of the breast funnel only comes in 25mm and 28mm. However, the company also makes soft inserts in 16mm - 26mm.

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Retail pumps

- ▶ Freemie collection cups
 - ▶ Can't put them in microwave sterilizer bags or dishwasher—they will melt.
 - ▶ Can't put them in refrigerator or the cold—they will shrink and then milk will leak out.

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Retail pumps

- ▶ **Motif Duo**
 - ▶ Has backflow protector similar to Spectra and duckbill valves
 - ▶ Has 21mm, 24mm and 27mm flanges available, but must be bought through Amazon
 - ▶ Turns off in 30 minutes; battery life 2.5 hrs.
 - ▶ Can be used as single or double pump

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Retail pumps

- ▶ **Motif Duo—when used as double pump:**
 - ▶ **Motif Massage (letdown) Phase**
 - ▶ Level 1: 74 sucks/minute, 20mmHg suction
 - ▶ Level 10: 66 sucks/minute, 80mmHg suction
 - ▶ **Motif Express (expression) Phase**
 - ▶ Level 1: 76 sucks/minute, 20mmHg suction
 - ▶ Level 10: 38 sucks/minute, 140mmHg suction

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Retail pumps

- ▶ **Nature's Bond**
 - ▶ Pump comes with 24mm flanges and 18.5mm and 21mm flange inserts. (NOTE: Instruction manual says 74mm, 76mm, and 80mm flanges!)
 - ▶ Medela collection pieces will fit on Nature's Bond air tubes with 20mm loss of suction. Manufacturer does not recommend this, but a mother was doing it.
 - ▶ Nature's Bond maximum suction (double-pumping): 200mmHg
 - ▶ Nature's Bond with Medela parts maximum suction (double-pumping): 180mmHg

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Retail pumps

- ▶ **Nature's Bond (cont.)**
- ▶ **Two suction modes:**
 - ▶ Letdown stimulation mode: 100 sucks/minute; suction goes up to 140mmHg.
 - ▶ Expression mode: 50 sucks/minutes; suction goes up to -200mmHg with Nature's Bond parts. (180mmHg w/Medela parts.)

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