How to be a homebrewer ([redacted] medium-scale guide)

Version 1.4

Chapter 1: Introduction

Let's organise our lives around love and care
– Ezra Furman, Temple of Broken Dreams

Who can homebrew?

You don't need a bunch of academic credentials or lab experience to start making bathtub HRT. There are more important qualities that every homebrewer should have, but sadly most don't. You ought to be a neat freak who is willing to throw away a whole batch if it don't pass your quality control. You ought to care about the people you are supplying medication to more than you care about the money you're making off them. You ought to be honest, humble, transparent, and willing to accept criticism.

Your clientele comprises desperate people. Many will gladly use any piece of shit vial they can get hold of, complete with rust, hairs and rancid ingredients, and feel indebted to whoever made it. That might have been our only option for DIYing in the 00s, but we've moved past it in 2023. DIY is steadily becoming more and more mainstream, with demand rocketing as conventional routes to trans healthcare are increasingly restricted or banned. We need more homebrewers, but we must do our due diligence to make the medication we produce as safe and hygienic as possible. This isn't rocket science, and you will very quickly make your upfront costs back in profit.

This guide

There are two methods you can use to homebrew HRT safely. The first utilises syringe filters to fill pre-sterilised and pre-sealed vials, as described in my small-scale guide [redacted]. The second method is much more efficient and can be used to make batches of 20-50 vials using bottle-top or vacuum filtering. This is what I will teach you to do in this guide. The guide is very long, because the bottle-top method carries a high risk of contamination if it's not done properly.

Before you begin reading, I recommend you practice homebrewing using my small-scale guide. If you are only making HRT for yourself and your friends, this might be the best option for you going forwards. If you have a larger appetite for homebrewing, however, buckle up. I recommend reading this guide through a couple of times and making notes before deciding to purchase anything, because it's easy to eagerly buy a bunch of expensive equipment that you didn't need.

Do your research – I have tried to make everything as clear and cohesive as I can, and explained the reasons for all the things I am telling you to do, but don't take my word as gospel. Click the links! Google stuff!

Me

I am a homebrewer who makes and distributes HRT for free[redacted]. I hold it in good faith that this guide will be used in the spirit of mutual aid, rather than to benefit from the medical gatekeeping that oppresses trans people.

Chapter 2: Background information

Let's start with a few definitions:

Compounding means mixing things together. This is what you do. You are not a chemist, or a pharmacist, or a pharmacologist. You got some raw ingredients out the backdoor of a lab run by the Chinese mafia and mixed them up. You are a sterile cocktail-maker. Claiming to be anything else instils false confidence in your clientele.

Parenteral means the kind of drugs that you don't eat, including injectable medication. I don't use this word, but it's useful to know when you're researching how real labs make HRT.

Micro-organisms are germs. This includes bacteria, viruses, spores, and other stuff. **Pathogens** are bad germs which cause disease.

Sterilisation means getting rid of all the micro-organisms. We achieve this by applying heat for a long period of time. Technically, you can never guarantee that you have got rid of 100% of micro-organisms in your medication, so anything described as *sterile* in scientific terms is just really really really unlikely to have many micro-organisms on or in it. You can calculate exactly how unlikely this is, but we only need to follow the sterilisation procedures used in real labs. See *Sterilising glassware* in Chapter 3 for more information.

Depyrogenation is a word people like to throw around in DIY spaces to sound smart. It means that instead of just killing all the germs, you also destroy or remove all the nasty bits and bobs they carry around with them that make us sick. These bits and bobs are called endotoxins or pyrogens, hence removing or destroying them is depyrogenation. It's not like a super massive big deal if you don't depyrogenate your glassware before filling it.

Contamination is when you have something that you don't want in your vial. In addition to micro-organisms, homebrewed HRT can contain visible contaminants such as hairs, dust and clothes fibres. To avoid these, you need to clean and sterilise your vials before you fill them, microfilter the medication after it's mixed, and fill the vials using aseptic technique. Some contaminants are microscopic (too small to be seen by the naked eye), such as heavy metals. These are toxic and can't be filtered out. The only way to avoid them is to buy your ingredients from trusted suppliers, and get your shit tested just in case. I'll go more into this in *Ingredients* and *Testing* in Chapters 2 and 3.

Aseptic technique is a combination of methods used in a real lab to stop contamination by micro-organisms. Where you work, what you wear and how you clean your equipment and glassware are all things to consider as part of your aseptic technique. There's no one way to do aseptic technique, and I will give you multiple options with my recommendations throughout the guide.

What are the risks?

Our bodies have a complex system of defence against poisons and infections. Your skin may seem like a basic or simple organ, but it's actually very smart and forms a tough barrier against pathogens. Anything we eat has to pass by our stomach, which is an acidic hellhole designed to kill bacteria (or purge it in the fastest way possible). Anything that makes it past the stomach and gets absorbed into your blood is dealt with by the liver. That's all your booze, your pills (legal and illegal), and any other weird chemicals you happen to like. Your liver does its best to break it down for you to stop the rest of your body from getting damaged. This is why you have to take a much higher dose of oral HRT than injectable – a large percentage of it is destroyed by the liver before it can reach any other body tissue. This is called *first-pass metabolism*.

Injected medication bypasses our skin and liver. This means we are not only more vulnerable to infection, but also to anything poisonous which we inject. Contaminated HRT is incredibly dangerous, so don't fuck about or cut corners. Serious infections, including abscesses and open sores, are not uncommon among people who inject image- and performance-enhancing drugs. If this scares you, try making transdermal hormone gel instead – it's much safer, and there's a huge market for it.

Bacteria is your number one enemy. Airborne bacteria is floating all around you. As bacteria is generally heavier than air, it tends to sink downwards and land on surfaces, so hold sterile containers at an angle and cover them with tin foil or cling film while you are not using them. The places in your house with the most bacteria are probably on your body – your hands and fingertips especially. Imagine you are in a lab, learning about micro-organisms. If you were to press your fingertip into a petri dish and incubate it, you would see a garden of bacterial colonies bloom, growing to form an exact copy of your fingerprint in pale shades of yellow and green. Wash your hands for a few seconds and perform the experiment again – you no longer see the fingerprint, but the dish still produces plenty of spots where your finger was. Finally, wash your hands thoroughly for 40 seconds and perform the experiment a final time. You now have a plate with only one or two bacterial colonies growing on it. The moral of the experiment is to learn how to wash your hands properly before making injectable medication [link]!

Never brew when you have a cold or flu. If you or anyone you live with experiences vomiting or diarrhoea, wait until they are better and then wait another 48 hours before brewing.

Chapter 3: Preparation

The best place to homebrew:

- has floors which are easy to clean such as lino or tiling. Does not have a carpet
- is not close to a sink or other drain
- is easily cleaned, with smooth undamaged work surfaces and tiles on the wall
- does not have overhanging structures, e.g. shelves or cupboards, as these constantly shed bacteria
- is not too damp. If you live in a damp space, you may need a dehumidifier for your workspace
- isn't accessible to pets or pests.

Your kitchen is probably the best option, with at least a metre distance from the sink. Because you are using the space for cooking food between homebrewing, you must clean the room before each batch.

Ingredients

You will need:

- hormone ester
- benzyl benzoate (BB)
- benzyl alcohol (BA)
- carrier oil

For exact amounts, see *Recipes*.

Raws

You can buy drugs on the internet. There are several trusted sources of "raws" (pure chemicals in powder or liquid form) in China that will ship internationally. You should research which suppliers are tested and trusted – you can find them on diyhrt.cafe or steroid forums. They typically cater to manufacturers of image- and performance-enhancing drugs, but they were quick to catch onto DIY HRT and also offer estradiol esters. You can get all your ingredients from these sources, but I recommend paying a little more for carrier oil from a domestic supplier.

Raws suppliers operate out the back door of legit chemical plants. They are run by organised crime gangs. The trusted ones have had multiple people test their products and come back with 99.9% purity, but mafia operations are unstable and could collapse or be taken over at any time. Always get your shit tested. I recommend ordering your raws in bulk to minimise how many tests you need to do.

You will need to learn how to use cryptocurrency in order to purchase your raws.

Hormone esters

Research what type of product you'd like to make ahead of time. Both testosterone and estradiol are available as multiple esters, which means that another chemical is attached to it which alters the half-life and solubility of the final drug. Testosterone and estradiol enanthate are popular for both T and E. I don't recommend mixing esters, and I don't recommend making more than 2 products unless you are very organised. Label everything meticulously. If you make both T and E, either filter into separate reagent flasks which are clearly labelled, or clean everything very thoroughly multiple times between batches.

Some raws suppliers ship testosterone enanthate in liquid form as opposed to a powder. This is because its melting point is around 30-40° C, so it's easier to use it as a liquid.

Benzyl benzoate

Benzyl benzoate is a solvent which helps the hormone ester stay dissolved in the vial and not crash out of solution. It can cause post-injection pain, which affects some people more than others, and might not be necessary for some brews.

Benzyl alcohol

Benzyl alcohol is a preservative that stops bacteria from multiplying in the vial. It doesn't actually kill bacteria, so you can't just increase the concentration to counteract bad aseptic technique. Never make a vial without benzyl alcohol.

Carrier oil

The bulk of your medication will be made up of a refined vegetable oil. Get your carrier oil from a licensed cosmetic supplier in the EU or USA. Try to find one that is listed as 'pharmaceutical use'. This will be on the expensive side, but the cheaper stuff is more likely to have impurities. Pharmaceutical hormones are usually suspended in sesame or castor oil, which are very thick and difficult to inject. Thinner oils such as MCT oil (fractionated coconut oil), grapeseed oil, and cottonseed oil are typically used for homebrewing. I don't recommend MCT oil, because it's incompatible with most bottle-top filters. Allergies and mild sensitivities to different carrier oils are common, so consider offering more than one type.

Recipes

The following information has been adapted from actual pharmaceutical information documents for various hormone products made by pharmaceutical companies.

Drug constitution (percentages are by volume)					
Concentration of hormone ester	Testosterone cypionate		Testosterone enanthate	Estradiol valerate	
	100 mg/ml	200 mg/ml	250 mg/ml	20 mg/ml	40 mg/ml
Benzyl benzoate	10%	20%	30%	20%	40%
Benzyl alcohol	0.9%	0.9%	N/A (single-use ampoule)	1.9%	1.9%

When choosing the concentration of hormone you want to make, choose a value which will make it easier to calculate and measure each dose accurately. An advantage to making lower concentrations is that the vial will get used up faster, reducing the possibility that it will become contaminated over time.

Solubility

Lower concentrations of BB are generally desired to decrease the amount of post-injection pain that some people experience. However, there are so many different combinations of hormone ester, hormone concentration and carrier oil that it's difficult to know how low you can go. Low solubility will paradoxically cause more pain, even if the ester hasn't visibly crashed.

Some homebrewers claim that you don't need any BB at all, and I often get requests for custom vials without it, so consider stocking this as an option. I think a lot of people assume they are sensitive to BB without first trying another carrier oil or considering that their post-injection pain may be caused by a dirty vial. Maybe I'm just reluctant to stop using BB, as it makes the oil thinner and therefore easier for me to work with.

Calculations

This steroid calculator lets you input your desired drug concentration and batch size, and spit out exactly how much of each ingredient you will need [link]. Most homebrewers use it. However, I have found that it overestimates the volume of carrier oil required, leading to slightly underdosed vials. This is probably due to those mysterious "powder displacement" values being utterly made up bollocks. You can still use this calculator to work out how much hormone ester, BB and BA you need. Then "make up" the rest of the volume with carrier oil. I explain this more in *Mixing* in Chapter 3.

You don't need the steroid calculator at all if you understand how to use the following equation:

Volume (ml) x Concentration (mg/ml) = Mass (mg)

In more practical terms:

Number of vials x Volume per vial x Desired concentration = Mass of hormone ester required

e.g. 40 vials x 10ml each x 20mg/ml = 8000mg (equivalent to 8g)

Remember to convert your units. 1g = 0.001mg.

Please note that, while you are measuring most of your ingredients by volume, the hormone ester must always be measured by weight. This still applies if your hormone ester is shipped as a liquid. I've seen people online say that 1ml always equals 1g, and this is wrong. The densities of each hormone ester I have found online are only estimations, so I wouldn't recommend using them either.

These are my recipes for 400ml (40x 10ml) batches:

Testosterone enanthate (200mg/ml)
80g hormone ester
40ml benzyl benzoate (10%)
4ml benzyl alcohol (1%)
Enough carrier oil to make the volume up to 400ml (approx. 300ml)

Estradiol enanthate (20mg/ml)
8g hormone ester
40ml benzyl benzoate (10%)
4ml benzyl alcohol (1%)
Enough carrier oil to make the volume up to 400ml (approx. 300ml)

Equipment

Glassware

You will need:

- glass stirring rod
- glass measuring cylinder
- 1ml sterile syringes (no needle)
- 500ml glass beaker for mixing
- glass measuring cylinder

For a 400ml batch, I use a 50ml cylinder to measure out BB. I use several syringes per batch: 1x 10ml for BA, 1x 1ml for liquid testosterone, and some 1x 10ml that I use later for filling my vials. I don't re-use them.

Filtering

You will need:

- Bottle top filters (see below for details)

- Borosilicate glass 500ml reagent flask (plastic ring removed)
- PVC tubing
- Vacuum pump (manual brake bleeder or automatic)

Your filters are your most crucial bit of kit, so don't cheap out or find a knock-off version. It will probably take a bit of experimentation to find equipment that will work for you, so be patient. I've listed a few options below.

Your filter must fit the following specifications:

- **Sterile** (OR you are able to reliably sterilise it yourself)
- Pore size of **0.22um or smaller**, to filter out all the pathogens you are likely to have in your kitchen
- **Filter material is compatible** with your brew ingredients. Nylon, PTFE or PVDF are compatible with both benzyl benzoate and benzyl alcohol for a short period of time and at low concentrations. PES is incompatible.
- **Filter housing is compatible** with your brew ingredients. Polystyrene is incompatible with MCT oil. It will start to break down and leech plastic sludge into your brew, which won't be filtered out. Polystyrene technically has limited compatibility with benzyl alcohol, but we're using such low concentrations for such a short amount of time that we don't need to worry about it. If you disagree, filter the few millilitres of benzyl alcohol into your flask separately using a PDVF syringe filter. Polypropylene is compatible with MCT oil and benzyl alcohol, but none of the options I've found are presterilised.
- Fits onto your reagent flask. Most flasks are 45mm, so check your filter says this or "GL45".

Here is a table of bottle top filters you can buy.

	Compatible Filters	Housing Material	Sterility
NALGENE Rapid-Flow	Nylon	Polystyrene	Presterilised, single-use only
Corning	Nylon	Polystyrene	Presterilised, single-use only
Millipore Stericup-GV	PVDF	Polystyrene	Presterilised, single use only
Celltreat	Nylon	Polypropelene	Non-sterile
Autofil	Nylon	Polypropelene	Non-sterile
Nalgene Reuseable	Filter bought separately	Polysulfone	Autoclavable, but difficult to clean between uses.
Buchner flask (reuseable)	Filter bought separately	Glass	Autoclavable and resistant to high heat, but difficult to clean between uses.

The “reuseable” filters are temptingly cheap but highly impractical. Even if you can be bothered to clean them out between uses, which is harder than you’d think, it’s impossible to create a seal. I wasted a lot of time slaving over my old glass Buchner flask, pumping continuously until 3am because air was leaking out of it.

You could also check out capsule filters, which I’ve heard are fast and convenient, but I have no experience with these.

Some filter sets come with a plastic collection bottle which is prone to cracking. I recommend replacing this with a glass reagent flask (plastic ring removed). Sterilise the flask the same way you do with your vials.

An automatic vacuum pump will be much more convenient than a manual one, but it costs a lot of money.

Vial filling

You will need:

- borosilicate glass vials
- 10ml luer lock syringes
- 18G blunt detachable needles
- stoppers
- aluminium caps
- vial crimper

Most homebrewers use 10ml vials.
Make sure that your vials, stoppers, caps and crimper are all compatible with each other. 20mm is the standard size.

Get the type of cap pictured, with a circle of metal in the middle that pops out. Don’t get the ones with a ring pull that removes a strip of aluminium down the side of the cap opened, because this compromises the sterility of the vial. Don’t get the caps with a plastic lid if you want to perform a terminal heat sterilisation step without them melting.

Most homebrewers use butyl rubber stoppers, because this is pharmaceutical standard. I use silicone ones because they don’t blunt needles as much, and they’re less prone to vial coring. They’re probably not compatible with pure benzyl alcohol, but in low concentrations it’s fine.

A vial crimper is the tool used to fix the metal cap to the vial. You can use any metal object such as a teaspoon, but having the proper tool speeds up the process considerably.

What to wear

You will need:

- FFP2 masks
- hairnets
- sterile gloves
- a medical gown
- protective glasses or goggles (optional)

You need a new FFP2 mask, hairnet and pair of sterile gloves for each batch. The mask stops you from breathing germs into your work and must be worn at all times. The hairnet stops hairs from appearing in your vials and must be worn at all times. The sterile gloves keep bacteria from transferring from your hands into your vials, and must be worn during the vial-filling step. I use non-sterile nitrile gloves for mixing my brew, and expensive sterile ones while filling. You can also wear a medical gown/coverall with bunched sleeves to stop fibres from your clothing getting into the vials. I recommend wearing glasses or goggles to protect yourself in case you spill your raw powder.

Miscellaneous

You will need:

- 0.01g scale
- stainless steel spatula or stamp tweezers
- autoclave/InstantPot/fan oven (see *Sterilising glassware* in Chapter 3)
- cling film or tin foil
- a saucepan and hob
- weighing boats (30ml size recommended)

The amount of hormone ester you are putting into your medication is tiny, and your kitchen scale can’t tell the difference between 1.0 and 1.2 grams. You need a much more sensitive device. 0.01g scales are available for a lot of money from lab suppliers, or you can get a cheap one for measuring jewellery off eBay and check its accuracy using a set of calibration weights. You can use a weighing boat as a measuring container, or just a piece of tin foil. Use a spatula or stamp tweezers to pick up the hormone ester if it’s a powder, and use a syringe if it’s a liquid.

Cleaning supplies

You will need:

- kitchen paper
- 10% bleach wipes

- 70% isopropyl alcohol

See *Preparing your workspace* in Chapter 3.

Chapter 3: Brewing

Overview

Instruction	Notes	
Step 1: Preparing your workspace	Clean your glassware and working area.	
Step 2: Sterilising glassware	Stoppers: Steam sterilise in an autoclave at >121° C for >15 minutes.	Vials and flask: Dry heat depyrogenate in a fan oven at >250° C for >30 minutes or >200° C for >1 hour.
Step 2: Mixing	Measure out and mix all your ingredients over a water bath.	
Step 3: Filtration	Vacuum-filter your medication to 0.22um.	
Step 4: Vial filling	Using aseptic technique, fill, seal and crimp each vial.	
Step 5: Terminal heat sterilisation	Dry heat sterilisation in a fan oven at >160° C for >2 hours.	
Step 6: Visual inspection	Make sure there are no visible contaminants in each vial.	
Step 7: Labelling	Label and package your vials.	

Preparing your workspace

Keep your kitchen as clean as you can outside of working hours. Mouldy food and general uncleanliness will increase the levels of contamination in the air, which could take days to clear. I start the cleaning process the night before I brew. I use hot soapy water, focusing on removing all traces of food and grease. I remove all the objects and appliances from the countertops and put them in another room. I scrub the countertops clean, getting right into the corners. I clean the wall tiles, and the undersides of cupboards. I quickly clean any other places that might be dusty, such as on top of my fridge. I usually mop the floor. I chuck a bit of bleach into my sink drain for good measure. Because such a deep clean probably kicks up a lot of dust into the air, it’s good to let it settle overnight before proceeding.

I perform a second clean just before I am ready to start mixing. The second clean is much less thorough but uses stronger cleaning agents. I use 10% bleach wipes on every countertop and the wall tiles. Then I rinse these surfaces with water. Once they have dried, I clean them again with 70% isopropyl alcohol. This is how you would normally clean the work station in a real lab before doing any work.

Assume that all your equipment is extremely dirty when it is first shipped to you and between each use. Clean all your glassware thoroughly in hot soapy water, then rinse with distilled water. Let them dry, then rinse with 70% isopropyl alcohol and let them dry again.

Sterilising glassware

Everything that comes in contact with your medication after it is filtered needs to be sterilised. This includes the vials, stoppers, and the reagent flask that you will filter into. The two important variables in sterilisation are heat and time. For each procedure, make sure that the item being sterilised remains above the required temperature for the required length of time. An autoclave should perform this automatically, but for dry heat sterilisation you must wait for your oven to reach the desired temperature before starting your timer.

Dry heat sterilisation

You will need:

- a good oven with a fan
- a wide shallow pyrex dish
- tin foil

Kitchen ovens are not as reliable as the dry heat sterilisers you get in a real lab, but they are still a viable option if your oven has a working fan and calibrated thermostat. The trouble is that your oven is very dirty, and the heat is distributed unevenly, resulting in ‘cold spots’. You can create a 3D map of the heat distribution in your oven by placing many slices of bread on each shelf, and waiting to see the pattern which forms as they start to brown. Generally, the top of the oven will be hotter than the bottom, and the front will be hotter than the back, and the middle will be hotter than the corners. If there is a huge difference (e.g. some slices burn while others are barely toasted), your oven may be too shitty to use as a dry heat steriliser.

Heat your oven to 250° C (basically as high as it will go). Place a small tinfoil “hat” over each of your vials to stop to stop grease or particles of food from contaminating them, then put them upright in a clean shallow pyrex dish and cover them with another large piece of tinfoil. Place them in the hottest part of the oven for 30 minutes, or longer if your oven does not go that high. This should also depyrogentate the glassware.

The glassware will get very hot in the oven, but do not remove them using oven gloves. Your oven gloves are probably the dirtiest object in your whole house, covered in grease, old food and bacteria. They should not even be in the room while you are working. Let your covered glassware cool in the oven until you can remove them with a clean tea-towel instead.

You cannot use the oven to sterilise objects which aren't suited for high temperatures. Some plastic components will need to be steam-sterilised instead e.g. stoppers.

Steam sterilisation

You will need:

- a Class B autoclave or InstantPot
- 500ml+ distilled water

Ideally, use a Class B autoclave. Choose a cycle which maintains a temperature of 121° C for 15 minutes and dries your equipment at the end. The whole cycle will last about 30 minutes.

An InstantPot is the only brand of pressure cooker which has been proven to achieve the same level of sterilisation as an autoclave [link]. However, the cycle takes much longer – 2.5 hours instead of just 30 minutes. You will also need to dry each load after it has been sterilised to prevent moisture from getting into your medication.

Only use distilled water in your steam steriliser, as using tap water will leave calcium deposits. Make sure that you don't over-crowd the device. The chamber must be less than half full so that the steam can circulate between objects.

Some homebrewers try to verify that their steam steriliser has worked properly. My autoclave digitally records the temperature and pressure in the chamber throughout the cycle, which is enough for me. An InstantPot is probably fine, as it maintains its internal temperature and pressure electrically. Biological indicators, which are commonly used in real labs to verify sterilisation, are ampoules containing thermoresistant G-spores that change colour when they deactivate. They are expensive, and you will need to learn how to incubate them. I recommend them if you are using a different steam-steriliser than I have described here, or if you don't trust your InstantPot.

Autoclave tape is useless for our purposes. The tape changes colour when it reaches 121° C at any pressure and for any duration. In a real lab, autoclave tape is only used to differentiate between what has been autoclaved yet and what hasn't. It does not tell you if the autoclave is working properly.

I use a countertop Class B autoclave to sterilise my silicone stoppers.

Mixing

Measure out your ingredients

Place your cleaned weighing boat onto the jewellery scale and set it to 0.00g. Measure out your hormone ester. If it's a powder, use a spatula to gently transfer it into the weighing boat until you have the right amount. Be careful not to spill it or disturb it too much. If you are using liquid ester, you'll need to melt it first. Put the sealed bottle into a bowl of hot water and place a plate on top. After ten minutes, it should have melted into a thick liquid. Use a syringe to transfer it into your weighing boat. If your weighing boat is too small, try to find a bigger one instead of measuring it in two steps.

Next, measure out your benzyl benzoate and benzyl alcohol using the measuring cylinder and syringe respectively, and add them to the mixing beaker. To make sure your measurements are as accurate as possible, bring the measuring cylinder to eye level and measure to the centre (or bottom) of the meniscus [link].

Last, put in the carrier oil. Instead of trying to calculate the amount I need beforehand, I "make up" the volume to 400ml. You can always add more, but you can't add less, so use a syringe to drop in the last few millilitres without overshooting.

In case of spillage

Most of your ingredients can be cleaned up normally with kitchen towel and plenty of hot soapy water. If you get BB or BA on your bare skin, rinse it well. Get some eye wash kits from a first aid supplier, learn how to use them use them, and keep them where you can find them blind. Trust me, you will need these when something gets into your eyes.

Most of the time, raw powder spills are nothing to worry about and can be cleaned up using 70% isopropyl alcohol and a kitchen towel. If you have a major spill, however, and the powder gets kicked up into the air like a cloud, you must calmly and carefully leave the area. You want to avoid breathing it in or getting it in your eyes or mouth. Remove your clothes in the bathroom and put them in a plastic bag to deal with later. Decontaminate your skin. When the powder has completely settled, put on new clothes, including a mask, gown, gloves and glasses, and go back into your work area to clean up.

Heat and mix

Heat some water in a saucepan. Place your mixing beaker with your medication in it into the water and use the stirring rod to mix it until all the hormone ester is dissolved. It's okay for the water to simmer a little, but you don't want it to boil in case some droplets fall into the beaker.

Filtering

Set-up

Attach the PVC tube to the bottle-top filter (you may need to warm the tube in hot water to get it soft enough to do this, but don't let any steam into the tube). Attach the filter to the reagent flask. Attach the pump to the other end of the tube.

Check for a seal

Pour a little bit of the mixed medication into the well and test that it forms a seal by pumping a little of the air out of the flask. If the pressure quickly returns to normal, you have an air leak. There may be some moisture or something else preventing a seal from forming between the flask and filter. You can either try disassembling it and try again, or you can resign yourself to the painful experience of continuously pumping the air out for an hours and hours.

Once you're ready to start, pour the rest of your medication into the well and pump the rest of the air out. -0.05 MPa is a good level to keep the air pressure without cracking the filter. This process could take between 30 minutes and 3 hours, depending on how well-sealed your filter set is and the thickness of the medication.

Vial filling

This is the crucial step in making safe and sterile medication!

Minimising contamination

Airborne bacteria is constantly landing on your hands and equipment. To stop it getting into your vials, you can work within a homemade still air box. You could also try manipulating the airflow to go upwards by turning on a gas cooker next to where you work, but creating more airflow in a kitchen could create more contamination than it prevents.

Keep things under wraps

Your empty vials and stoppers will be sitting around for a while as you fill them. I keep mine in the same pyrex bowl which I sterilised them in. I put the stoppers in some cling film and only uncover them enough to remove one at a time.

Once last clean!

Just before you uncover your vials, get the 70% isopropyl alcohol back out and do one last clean. Clean the outside surface of your reagent flask (where you will be holding it) and the work surface where you are filling. Let it dry. Make sure you can pick up your stoppers without touching the

cling film or the container they are in. Then, once you are completely ready, put on a new pair of sterile gloves and begin filling.

Don’t touch anything to anything

Don’t touch anything except the reagent flask, vials, stoppers and syringe until you are completely finished. If you have to stop to itch your head or something, put on a new pair of sterile gloves. It’s hard to keep bacteria from falling into the flask you are filling your vials from, as it will be uncovered for a while. Hold it at an angle, don’t move it around too much, don’t place it under any shelves or cabinets, don’t reach over it, and don’t touch the rim. Don’t let your filling syringe touch anything before you pierce the tinfoil hat on each vial to fill it. Don’t brush it against your clothes or the rim of the flask. If you need to put it down, rest it in the flask. When picking up the vial stoppers, try not to put your fingers on the part that goes in the vial.

Be efficient

You need to put a stopper in each vial as soon as it is filled. Put each stoppered vial to one side and immediately fill the next one. Work fast but carefully. Don’t overfill your vials – if you are using 10ml vials make sure to only put in 10ml. Filling them close to the top will cause ‘blowback’, where the stopper does not sit comfortably in the opening without popping out. Once this is done, you can crimp all the vials at once. If you’re a clumsy person or find the filling process slow, consider forming a production line with a trusted comrade – while one person fills, the other person stoppers and crimps.

Terminal heat sterilisation

You will need:

- a good oven with a fan
- an oven thermometer
- a wide shallow pyrex dish

In a real pharmaceutical lab, the finished vials are normally sterilised after they are sealed and crimped. This final step is called terminal heat sterilisation. Oil-based medication can only be sterilised using dry heat. It cannot be steam-sterilised. Most homebrewers disagree with me here, and it is a point of contention in the pharmaceutical manufacturing industry too. All I’m going to say is, the EMA guidelines state that aqueous medication can be steam-sterilised, but non-aqueous medication can’t [link]. Unless you have an approved industrial-standard autoclave, go with dry heat.

Terminal heat sterilisation is similar in principle to the steps outlined for sterilising empty glassware in *Dry heat sterilisation* but requires lower temperatures and more time. Pre-heat your oven to 180° C and place the vials in the hottest part of the oven for 2 hours. I recommend placing an

oven thermometer just in front of your vials and checking that the temperature stays above 160° C at all times. If the temperature fluctuates a lot as the thermostat turns on and off, your oven is too shitty to perform this step adequately. Don't be tempted to crank the heat up to max, as your medication will start to break down at high temperatures (please contact me if you have more information on thermal degradation of hormone esters).

Take the vials out straight away at the end of the cycle. You don't need to worry about your manky oven gloves, as the vials are already sealed.

Terminal heat sterilisation is really important, so if your oven is too crap to do it properly, consider deliberately breaking it and badgering your landlord for a replacement. You could even offer to help pay to replace it with a reliable and expensive one.

Quality control

Accept now that you will have to throw some of your vials away – and sometimes even entire batches. It might hurt, but it's not going to hurt as much as getting a complaint from someone who has found a hair in their vial.

Visual inspection

Once each batch is crimped, hold each one up to a bright light and check for floating particles. If you see anything at all, reject the vial and get rid of it. You might want to repeat the process once or twice to be extra sure. Keep your rejects separate from your passes and unchecked vials to avoid getting them mixed up.

It's best to come up with a visual inspection plan before you start the process. Track your reject rate per batch, and over the course of multiple batches. How many rejects does it take for you to throw a whole batch away – one or two? At what point do you stop making vials and try to improve your procedure? What will you do if you can't solve the problem?

Testing

Chemical testing of your raw ingredients can be used for the following things: to verify that you have been sent the correct raws and to check for heavy metal contaminants. For the first objective, use gas chromatography MS testing. For the second, select heavy metal analysis.

You can pay for your finished vial to be tested at Janoshik. However, make sure you pay for the testing with Monero if possible, as any personal details you give them could be seen by the police.

It’s best to test a finished vial so that you know all your ingredients are sound. I also recommend testing every time you buy a new shipment of raws, just in case.

If you can’t afford these services, you can do a few cheeky tests of your own using your knowledge of each chemical to identify them. The benzyl benzoate should smell faintly of “sweet-balsamic”. Benzyl alcohol should smell strongly of sweet almond. Don’t worry if those descriptions confuse you – you’ll learn how to identify each one by smell alone.

	Testosterone esters		Estradiol esters		
	Enanthate	Cypionate	Enanthate	Cypionate	Valerate
Melting point	~35° C	~100° C	~95° C	~300° C	~144° C
Dissolves in water	No	No	No	No	No
Dissolves in benzyl benzoate	Yes	Yes	Yes	Yes	Yes

As you can see, it would be relatively easy to check that your hormone ester is legit if you use testosterone enanthate or estradiol enanthate. Put a small amount of the ester in a glass container and place it in a water bath. Heat the water from room temperature. Testosterone enanthate should melt pretty fast. Estradiol enanthate should melt when the water starts to simmer. Put a thermometer in the water if you want to be super accurate. Then test to see if your ester dissolves completely in benzyl benzoate but not water. Did it react in all the ways you expected it to? Great. Now you just have to pray it’s not loaded with mercury.

Labelling

Each vial should be labelled with the following information:

- drug name
- concentration
- carrier oil
- percentage of BB
- percentage of BA
- how to use the medication (“for subcutaneous or intramuscular injection only”)
- how to store the medication (“keep at room temperature out of direct sunlight”)
- some way of identifying the homebrewer
- a batch number and/or the date you made it
- the shelf life of the vial after it has first been used.

The batch number can be used to recall a batch if somebody reports an adverse reaction that you believe is due to bacterial contamination. I recommend putting the date you made your vial and an estimated shelf life instead of an expiration date. It’s generally accepted that a vial is only good for up to a year after its first use, and pharmaceutical vials have a shelf life of 5 years if unopened.

This information can be printed on a sticker on the vial, or on the packaging it comes in. I use an information leaflet [redacted]

Chapter 4: Troubleshooting

Post-injection pain

It's common for people to get irritation after injecting. If you get lots of reports of this, especially multiple from the same batch, you have a problem that needs to be fixed.
Possible causes and solutions:

- Moisture in the medication. Dry your glassware well before use. If you live in a damp place, get a dehumidifier for your workspace.
- Calcium in the medication. Only use distilled water designed for use in an autoclave to steam-sterilise glassware.
- Bad quality carrier oil. Find a different supplier.
- Individual sensitivity. Offer your client a vial with a different carrier oil. Their reaction may also be due to benzyl benzoate.
- Filter incompatibility. The plastic in your filter may have degraded into the oil. Double-check the compatibility of your materials, and remember that MCT oil degrades polysterene filter housing.
- Low hormone solubility. This can cause pain even if the hormone hasn't visibly crashed. Increase the concentration of benzyl benzoate and make sure the oil is completely clear before filtering.

Hairs/fibre/particles in the medication

You're always going to have to throw away the occasional vial due to visible contaminants. Even pharmaceutical manufacturing labs have a quality control step for this reason. However, if you're having to throw away one or more vials in every batch, you have a problem that needs to be fixed.
Possible causes and solutions:

- Insufficient cleaning of glassware. Use plenty of distilled water and 70% isopropyl alcohol to rinse out your glassware before it's sterilised. Reuseable filter stands are hard to clean, so switch to single-use ones if you notice more fibres appearing over multiple batches.
- Clothing that sheds fibres. Wear a hairnet and medical gown.
- Airborne particles landing in the vial during filling. Clean the whole room you are working in the night before to give time for the dust to settle. Work faster in a space with an a stronger upwards draft. If nothing solves the problem, make a flow hood, or even a clean room if you have the time, money and space [link].

Hormone crashing out of solution

When your hormone ester undissolves itself, it will look like fine shards, flecks or floating wisps have appeared out of nowhere in the vial.
Possible causes and solutions:

- Vial stored in a cold place. Place it in a bowl of very hot water for five minutes and shake it.
- Not enough benzyl benzoate. Increase the concentration.

Cloudy solution / weird bubbles

Sometimes vials will have a strange unexplained appearance. If more than one vial is affected, throw away the whole batch.
Possible causes and solutions:

- Moisture in vials. Make sure to completely dry your vials before you start filling them. A Class B autoclave will dry the vials at the end of the cycle, but it won’t work properly if you over-fill the chamber. Moisture in vials is not dangerous, but it will make the medication appear funny and cause irritation when injecting.
- Not enough benzyl benzoate. Increase the concentration.

Chapter 5: Threat modelling

Threat modelling means avoiding trouble ahead of time. Spend plenty of time researching this, starting here [link].

The Law

If your operation is small- or medium-scale and you don't belong to a racialised or criminalised group, you can probably fly under the radar of the law. Avoid more heavily-policed criminal activity, such as burglary or dealing 'hard' drugs to stop the police stumbling across your operation by accident. Remember, things could change. It only takes a couple more media panics and a little political pressure for a well-funded police operation to begin. And in the worst-case scenario of all our fascist dystopian nightmares, they will destroy any homebrewer they find. Don't do anything you'll regret later.

Producing medication without a license

Homebrewing is illegal everywhere. Research the law on producing medications without a license in your country. What governing body gives out these licenses? How harshly do they go after unlicensed manufacturers?

In the UK, the MHRA will normally send unlicensed sellers multiple warnings before coming after them with force. They don't have the resources to find out your identity as long as you don't make it super obvious.

Anabolic steroids

Testosterone is an anabolic steroid, which is often illegal to possess with intent to supply. Find out the legal classification of T in your country. How heavily is it policed? Can you find many cases of steroid dealers or labs getting busted in your country? How did the state find out about these operations? Read steroid forums, make contacts with other homebrewers, and keep an eye out for news about compromised supply lines and other problems.

In the UK, testosterone is a Class C drug. Police usually only bother to actively pursue Class As, and medium- or large-scale operations involving Class Bs. To find yourself the target of a police operation involving steroids, you have to be a whale. In 2016, Sheffield police busted a roid ring worth millions of pounds after a three-year investigation involving multiple constabularies across the country. I don't think any homebrewers need to be worried about this kind of police time and money being spent on them. Small- and medium-scale steroid labs, domestic distributers and petty dealers were exclusively found by accident while the police were looking for something else.

Doxxing

The consequences of getting doxxed are chaotic and unpredictable. They range from traumatic to deadly. Assume that far-right actors and transphobic conspiracy-theorists are lurking in every trans Discord server, forum and trans activist group chat. If they know you are a homebrewer, they will try to form a profile on you, so hide your identity as best you can. Don’t discuss your personal life, don’t post pictures of your pets, and delete all your other social media.

Best practice

Acquiring supplies

Always use Monero to purchase your raws, especially testosterone. Always send your address via PGP encryption. Use the name you normally use for deliveries, so that the parcel doesn’t look suspicious.

For your lab equipment, you can usually get away with buying most of it with your bank card from eBay, Amazon or AliExpress. You will have to buy your bottle-top filters from a professional lab supplier, which carries increased risk as it is a suspicious item. The largest lab supplier sites such as ThermoFisher have a shared database of suspicious purchases, and will store your details automatically and indefinitely. Pigs can easily access this database, and any two suspicious purchases ordered to the same address or with the same payment detailed will be flagged for investigation. So if you don’t want a home visit (or worse, a raid), use a prepaid debit card which you bought with cash, and never re-use an address for buying filters.

Never buy a pill press unless you know what you’re doing. To the cops, if you’re ordering a pill press then you must be operating an opioid lab. I wouldn’t even buy one off a darknet market because I’d worry about falling into a honeypot.

Sending vials in the post

If you’re using an online shop and sending vials directly to your customers, there are a bunch of extra security steps you may want to consider. Research how darknet vendors obscure their identity, such as wiping prints off their products and avoiding traceability if a parcel is seized. If you’re sending parcels outside of your country, you will need to disguise your product as something else to dodge customs. Most of the time this can be achieved by labelling it as “body oil”.

Laundering money

Your country’s tax office is well-funded and not to be fucked with! Make sure you’re either dealing with small enough amounts of money (less than

£10,000 per year should be fine – at a guess) to fly under their radar, or find a solid money-laundering gig [link]. This is way above my pay scale, so I can't give you much advice here.

The End

Thanks for reading my guide. Questions and criticism are very welcome. I'm not claiming to be perfect or the best homebrewer, and I am constantly improving my process with feedback from the community. [redacted]

This guide took a long time to make, so if you found it useful in any way please donate to my [redacted]! All donations go directly to helping me make and distribute HRT for free to people who need it!