# Mutual aid homebrewing

Version 2.1



**:) PRACTICE GOOD INFOSEC :)**

Remember, transphobes lurk in online DIY spaces and target homebrewers. Please only share this guide and my website link with people you know by private message.

## Manufactured by Tyger

This is a zero-profit mutual aid project which is funded by donations. For further information, please visit **tygerHRT.com**

# Chapter 1: Introduction

*Lose your way completely but stay alive, ditty bop sha lang lang*
– Ezra Furman, Ordinary Life

## Who am I?

I have a background in microbiology. I am an anarchist and an anti-capitalist. I have been homebrewing since March 2023. I use he/him pronouns.

## This guide

There are two methods you can use to homebrew HRT safely. The first is described in my small-scale guide on my website, which I recommend you try out first. Make a small number of vials for yourself and your friends. The second method is much more efficient and can be used to make batches of 20-50 vials using bottle-top 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 higher risk of contamination if it's not done properly. I recommend reading it 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!

Let's start with a few definitions:

**Compounding** means mixing things together. This is what I do. I am not a chemist, or a pharmacist, or a pharmacologist. I got some raw ingredients out the backdoor of a lab run by the Chinese mafia and mixed them up. I are a sterile cocktail-maker.

**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** isn't just 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.

**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 depyrogenate 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 to pray. 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.

## 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 designed to kill bacteria (or purge it in the fastest way possible). Anything that makes it past the stomach and gets absorbed into the 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. It is possible to get a very serious skin infection, including abscesses and open sores, from non-sterile injections. If this scares you, try making transdermal hormone gel instead – it's much safer, and there's huge demand 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 few days before brewing.

# Chapter 2: 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 (e.g. the entire UK), 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 buying carrier oil from a domestic supplier.

The trusted raws suppliers have had multiple people test their products and come back with 97-99% purity. The cost per unit mass decreases the more you buy at once.

You will need to learn how to use cryptocurrency in order to purchase raw T.

## 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 enanthate 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 quite organised. Label everything meticulously, and clean thoroughly between batches. I make both T and E esters, and I have separate glassware for each hormone.

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, and I believe that is more irritatant than other oils.

## Recipes

The information in the table below has been adapted from actual pharmaceutical information documents for various hormone products made by pharmaceutical companies.

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.

| 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% |

## 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 a carrier oil other than

MCT. Some clients have told me that they get less irritation when switching from an MCT oil-based vial to my grapeseed oil-based vials, even though my vials have a higher concentration of BB.

## Calculations

*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 500ml (50x 10ml) batches:

**Testosterone enanthate (200mg/ml)**
100g hormone ester
50ml benzyl benzoate (10%)
5ml benzyl alcohol (1%)
Enough carrier oil to make the volume up to 500ml (approx. 400ml)

**Estradiol enanthate (20mg/ml)**
10g hormone ester
50ml benzyl benzoate (10%)
5ml benzyl alcohol (1%)
Enough carrier oil to make the volume up to 500ml (approx. 400ml)

# Equipment

## Glass and plasticware

You will need:

- glass stirring rod/steel spatula
- 50mL glass measuring cylinder
- 600ml glass beaker for mixing
- 1ml luer lock syringes
- 10ml luer lock syringes
- 18G detachable needles

I use the 50ml cylinder to measure out BB. I use several syringes per batch: 1x 10ml for BA and 1x 1ml for liquid testosterone.

## Filtering

You will need:

- Bottle top filters (pictured)
- Borosilicate glass 500ml reagent flask (with plastic pouring 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 list of filters available online:

| | 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 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 vacuum 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. Clean and depyrogenate 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 more.

## Vial filling

You will need:

- borosilicate glass vials
- stoppers
- aluminium caps
- vial crimper
- electronic pipette filler
- 10ml serological pipettes

I recommend getting an electronic pipette filler. It’s an expensive purchase, but easier and faster filling is much better aseptic technique. Pipette fillers are used with sterile serological pipettes and require careful use and a little maintenance to stop them getting contaminated.


You can buy vials in 10ml, 5ml or 3ml. Using larger volume vials reduces the cost per mg of hormone, but the risk of contaminating a vial increases with duration of use. I use 5ml vials as a compromise between cost and sterility. Amber glass is possibly better than clear glass at preventing photodegradation of the ingredients.

Butyl rubber stoppers are most commonly used and are the pharmaceutical standard. I use silicone ones because they don’t blunt needles as much, and they’re less prone to vial coring. They’re not compatible with pure benzyl alcohol, but in low concentrations it’s (probably) fine.

Get one of the cap types pictured, with a circle of metal in the middle that pops out, or with a plastic flip-off lid attached to the aluminium cap. Don’t get the ones with a ring pull or that remove a strip of aluminium down the side of the cap when opened, because this compromises the sterility of the vial.

A vial crimper is the tool used to fix the metal cap to the vial. Get the right one for the type of cap you are using (aluminium or plastic and aluminium).

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

## What to wear

You will need:

- FFP2 masks
- hairnets
- nitrile or latex gloves
- protective glasses or goggles (optional)

You need a new FFP2 mask, hairnet and several pairs of 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 gloves protect you from chemical irritation. They also stop contamination from your hands. You must sterilise your gloves thoroughly with 70% isopropyl alcohol and let them dry before the vial-filling step. You can wear a medical gown/coverall with bunched sleeves to stop fibres from your clothing getting into the vials. You can wear 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
- an electronic hotplate
- weighing boats (100ml 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 from exchangesupplies.org. 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:<br>Steam sterilise in an autoclave at >121° C for >15 minutes. | Vials and flask:<br>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 hotplate. | |
| Step 3: Filtration | Vacuum-filter your medication to 0.22um. | |
| Step 4: Vial filling | Use aseptic technique to fill each vial, then seal and crimp. | |
| Step 5: Terminal sterilisation | Autoclave or pressure-cook. | |
| 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 clean 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 clean them again with 70% isopropyl alcohol wipes. 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, then rinse and shake multiple times with distilled water.

# 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 depyrogenation

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. You should double-check that your oven reaches the temperature it says it does on the thermostat using one or two oven thermometers.

Heat your oven as high as it will go. Fix a small tinfoil “hat” tightly over each of your vials 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. Secure the edges tightly. Place them in the hottest part of the oven for 30 minutes, or longer if your oven does not go that high.

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.

Try to verify that your steam sterilisation process has worked properly. Autoclaves record the temperature and pressure in the chamber and automatically adjust the

cycle length for bigger loads. An InstantPot is probably fine, as it maintains its internal temperature and pressure digitally, but don’t overfill it.

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 would need to be able to incubate them to use them. I don’t bother.

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 and an InstantPot to sterilise my vials after they have been filled and crimped (see *Terminal sterilisation)*.

# 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 500ml. 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 liquid 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, and keep them where you can find them blind. Trust me, you should get these!

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.

## Heat and mix

Place your mixing beaker with your medication in it onto the hotplate and use the stirring rod to mix it until all the hormone ester is dissolved. I use a hotplate which doubles up as a magnetic stirrer to speed up the process.

# Filtering

## Set-up
Attach the PVC tube to the bottle-top filter (you may need to warm the tube in your hands to get it soft enough to do this, but don’t use hot water as it will let steam into the tube). Screw the filter in place on top of the reagent flask. Attach the pump to the other end of the PVC tube.

## Check for a seal
Pour enough of the mixed medication into the filter to cover the bottom of the well. 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, try a new filter or 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.

## 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 pipette filler, 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, sterilise your gloves by rubbing them all over with 70% isopropyl alcohol. Once they are dry, you can begin filling.

## Don’t touch anything to anything
Don’t touch anything except the pipette filler, reagent flask, vials, and stoppers until you are completely finished. If you have to stop to itch your head or something, put on a new pair of gloves and sterilise them. It’s hard to keep bacteria from falling into the reagent flask full of medication, 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 touch any part of the serological pipette except the very top, and don’t let it touch anything as you fill each vial. Don’t brush it against your clothes or the rim of the flask. If you need to put it down, bin it

and unwrap a new one. When picking up the vial stoppers, try not to put your fingers on the part that goes into 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 sterilisation

In a real pharmaceutical lab, finished vials are sterilised after they are sealed and crimped. This final step is called terminal sterilisation. Put your finished and sealed vials into an autoclave or pressure cooker for 30 minutes. Don’t fill the chamber more than halfway and leave a finger’s width of space between each vial. This process isn’t guaranteed to achieve good sterilisation, but it’s still worth doing. Keep reading if you’d like to know my reasoning behind this, but feel free to skip to the next section if you don’t really care.

This is a lot of disagreement between homebrewers about the usefulness of terminal heat sterilisation. At first I did not perform this step, as I do not believe that you can reliably sterilise vials this way, and I was more confident in filter sterilisation. I have since realised that it can’t hurt to include terminal sterilisation. However, I am only performing it as a *precaution*, and I still *rely* on depyrogenation, filtration and good aseptic technique to prevent bacteria from getting into the vial in the first place.

Read this. It is the guideline for making sterile medication for all pharmaceutical companies in the EU. See Figure 1 in Part 5, where we see that the first choice for sterilising aqueous (water-based) medication is in an autoclave at >121° C for >15 minutes. As water is a great conductor of heat, the heat applied to the outside of a vial of water will quickly transfer inside and become evenly distributed throughout. Our medication is oil-based, or non-aqueous, which poses a challenge: oil is a very poor conductor of heat. We’d need to use a higher temperature for a much longer duration. Take a look at the decision tree in Part 5, Figure 2, which recommends we subject our vials to >160° C for >2hr in a dry heat steriliser. If we were to follow this guidance, we would not only be relying on our kitchen oven to perform as well as a highly accurate laboratory device, but we would also be risking some thermodegradation of our ingredients. I have no idea at what temperature testosterone and estradiol esters start to break down, and I can’t interpret the research I find online nor make a good estimate because I don’t have a background in chemistry.

If we further follow the decision tree in Figure 2, we can also likely rule out the second and third options. That leaves us with the final option, which is to leave out a terminal sterilisation step entirely. But doing something is better than doing nothing, even if the extra step is inadequate. Using an autoclave allows us to control the temperature better than an oven, and 30-60 minutes is probably a good duration.

Some homebrewers rely entirely on autoclaving (or even plain boiling) to sterilise their vials, and don’t filter at all. I still think this is an awful idea.

# Quality control

Accept now that you will have to throw some of your vials away – and sometimes even entire batches.

## 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?

## Cap tightness

The vial caps should be crimped on tight enough that they cannot easily be turned by hand.

## Testing

Okay, so, I get my vials tested by Janoshik, but I don’t think that the results tell you anything useful about the vials. I only do it to put people’s minds at ease, but arguably it gives them a false sense of security. Look into it and figure out for yuorself if you want to spend that much money. We all get our raws from the same place(s), and there are other ways to check you have been sent the correct chemical.

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 hope it’s not loaded with mercury.

# Labelling

Your customer should be able to find the following information for each vial:

- 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 upright at room temperature and out of direct sunlight”)
- some way of identifying and contacting 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, which I roll up into the box containing my vials.

# 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:

- Individual sensitivity to MCT oil. I strongly believe that MCT is more irritant than other carrier oils, and many people have told me that they experienced less irritation when switching from an MCT-based vial to my grapeseed-based vials, even when my vials contain a higher concentration of benzyl benzoate!
- Individual sensitivity to benzyl benzoate. Anecdotally, people experience less irritation when injecting larger volumes at a lower concentration of benzyl benzoate, even though the total amount of BB injected is the same. Simply put, injecting 0.2mL from a 20mg/ml vial with 10% benzyl benzoate may cause less irritation than injecting 0.1mL from a 40mg/mL vial with 20% benzyl benzoate.
- Moisture in the medication (see *Cloudy vials*).
- Bad quality carrier oil. Find a different supplier.
- 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 to rinse out your cleaned glassware before it’s sterilised. If you have time, do a final rinse the night before with 70% isopropyl alcohol and leave them upside-down to dry. 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. 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 vials

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. If the vials appear clear at first, but are cloudy after being put in the pressure cooker, then the cap has not been fitted tightly enough. Moisture in vials causes irritation when injecting and can pose an infection risk.
- Bacterial growth? More likely to be moisture if it happens straight away.
- Hormone crashing. Heat and shake to dissolve.

# Chapter 5: Threat modelling

Spend plenty of time researching your threat model and security measures, 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. But remember, it only takes a little political pressure or a media panic for a well-funded police operation to begin. Don’t do anything you’ll regret later.

### Manufacturing and supplying 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. They also don’t have the resources to find out your identity, as long as you don’t make it super obvious.

### Manufacturing and supplying controlled substances

Testosterone is an anabolic steroid, which is illegal to supply, or to possess with intent to supply in the UK. 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.

## Internet trolls

These people genuinely scare the shit out of me, so I’m going to recommend that you do most of your organising in real life. Having a website is useful for promotion and for making people feel less sketched out by using homebrewed vials, but you **don’t need one** if you are starting out with good real-life connections. Most internet trolls are only in it because trolling is the only truly exciting thing in their lives, so if you do have an online presence try to make it as minimal and boring as possible. Especially avoid the forums which are familiar to trolls such as Reddit and Discord. Encourage good infosec

in your clientele. For example, ask them not to post “reviews” of your products publicly.

# 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 multiple suspicious purchases ordered to the same address or with the same payment detailed could be flagged for investigation. So if you don’t want a home visit (or worse, a raid), make sure all your purchase details match up, and never re-use an address.

Never buy a pill press unless you really trust your security measures. To the cops, if you’re ordering a pill press then you must be operating an opioid lab.

## Operating a website

I don’t recommend having a website. It opens you up to a shitworld. If you are vain like me and you really want one, follow this advice:

- Use a website host that offers whois privacy protection, has servers located outside of your country, and accepts cryptocurrency.
- Delete the metadata from **all files** you upload to the website.
- Refrain from blogposting or creating controversy.
- Totally isolate your homebrewer activity from the rest of your computer activity by using a separate OS and/or device to do *absolutely everything*. I recommend TAILS plus Tor or Qubes plus Tor, or Graphene OS on a Wifi-only phone with a good VPN.
- Build trust with people in your real life community. Don’t rely on internet strangers.
- Assume everything you put online will be available forever. Don’t post anything you’ll regret later.

## 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” and including a fake receipt.

## Laundering money

I don’t know how to do this! Don’t let £1000s pass through your bank account unless you can explain it to the tax office. I can’t give you much advice here. But it’s good to understand the risks. Watch this video [link].

# THE END

Thanks for reading my guide. Questions and criticism are very welcome. I am constantly improving my process with feedback from the community and other homebrewers. There are ways of contacting me if you ask around.

This guide took a long time to make, so if you found it useful in any way please make a donation. All donations go directly to helping me make HRT and deliver it to people who need it!