Classic formula quantity comparison between FCG Granules and standard 5:1 ratio granules

<table>
<thead>
<tr>
<th>Name</th>
<th>Raw herb (g)</th>
<th>Equiv. factor</th>
<th>FCG (g)</th>
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<td>Shu di huang</td>
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<tr>
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<tr>
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FCG Full Composition Granules

Now available in the UK through exclusive distributor Donica Health

FCG Full Composition Granules offer a radical new approach to the formulation and production of concentrated herbal granules, providing a degree of clinical efficacy equivalent to that of traditional herbal decoctions.

The brainchild of Chinese herbal pharmaceutical company Kang Ren Tang, these granules are the outcome of more than a decade of intensive research, development and clinical trials, conducted with the aim of determining the cooking methods most appropriate for retention of all the ingredients of each herb. The application of patented production technology and advanced quality control methods (including infrared fingerprint spectrum techniques) makes these granules the optimum response to modern demands for effective and convenient herbal solutions.

Kang Ren Tang is the only company in the world specialising in this type of granule manufacture and now possesses more than 100 patents relating to its production and quality control techniques. By integrating its expertise in traditional Chinese medicine with the advantages of modern production methods, the company has been able to take full advantage of its inventions and the technological know-how it has acquired to establish an integrated, automated, full composition granule dispensary system based on the principles of TCM pattern differentiation.

To date, more than 400 different types of materia medica have been converted into FCGs with an effectiveness equivalent to that achieved by traditional methods of cooking herbal decoctions.

The elegant, tailor-made solutions offered by an automated dispensary system are solidly backed up by the benefits of standardised production and the application of extensive and reliable quality control throughout the sourcing and manufacturing process. Such advantages mean that Kang Ren Tang granules are now widely used in TCM hospitals and clinics throughout China, where their consumption currently surpasses that of traditional decoctions.

The high level of effectiveness and increased convenience of use mean that these granules have also elicited an enthusiastic response from patients — not just in China, but in many other countries around the world such as the USA, Canada, Australia, New Zealand, Singapore, Malaysia, Japan, Korea and Russia.

What are Full Composition Granules?

Until recently, the customary method of taking herbs involved the time-consuming process of decocting a prescription of raw herbs in water twice and drinking the resulting liquid. In the last few years, the use of granules based on herbal extracts has increased in popularity. However, issues have arisen relating to the concentration ratio and to whether a combined granule formula taken as an infusion can be as effective as drinking a decoction.

The idea behind FCGs is to produce a wide range of herbal granules whose effectiveness can be clearly demonstrated in clinical trials and experienced by practitioners and patients as
being equivalent to that achieved by herbal formulas prescribed and decocted in the traditional way.

Using traditional formula decoctions as the standard for comparison, Kang Ren Tang has developed a variety of production techniques for individual Chinese materia medica on the basis of the inherent characteristics of these substances. It is the first manufacturer to offer an effective and reliable solution to the problem of granule equivalence. This has enabled it to advance beyond the hitherto “industry standard” 5:1 ratio for concentrated powders and granules.

Kang Ren Tang’s exhaustive ten-year research programme has enabled it to define the best source and species of each of the 418 materia medica offered in its range. In addition, it has identified the most appropriate way for each materia medica to be cooked, either individually or together, so as to ensure that its granule extract is equivalent in effect to that when used in a combined decoction. This has also included investigation of appropriate processing techniques for 109 types of pao zhi materia medica.

This has been an iterative process, involving various chromatography techniques and the use of infrared fingerprint spectrum testing, a method which is commonly used for determining the characteristics of Western pharmaceuticals but which to date has been more rarely applied on a commercial basis to herbal materials. Furthermore, each materia medica has been tested hundreds of times through numerous clinical trials on patients. Studies continue today into the maintenance of quality standards and the discovery of further advances.

In addition, modern production techniques have been adopted that imitate traditional cooking methods based on decoctions. This means that all the ingredients in the decoctions are transferred to FCGs through extraction, concentration and spray-drying granulation. This method makes it much more convenient for the patient, since all that is needed is to add boiling water to the granules to produce the same effect as a traditional decoction.

**What quality control measures are applied in FCG production?**

As a GMP-certified pharmaceutical company, Kang Ren Tang has established a quality control system throughout its production process, based on strict adherence to Chinese Pharmacopoeia standards through the application of thin layer chromatography (TLC) for qualitative analysis and liquid chromatography for content determination. Not only that, the company is the only manufacturer applying infrared fingerprint spectrum techniques to herbal medicines to achieve quality control at all stages of the production procedure.

As a result of its FCG research, development and production programme, Kang Ren Tang has found that the authenticity (dao di) of the materia medica involved cannot be traced solely by the application of TLC and liquid chromatography. This is because these procedures are not able to verify the locality, species, conformity to processing requirements, and length of cultivation of the materia medica tested. **IR fingerprint spectrum technology for herbal medicines is the only method that can represent a complete set of information for a particular materia medica, thereby enabling false materia medica to be detected and discarded. IR fingerprint spectrum technology enables quality to be controlled throughout the production process, ensuring a consistently high, stable level of product quality from batch to batch.**
Kang Ren Tang has documented more than 6000 standard fingerprints to date and has established a comprehensive database — including data for raw and processed materia medica, intermediate products and finished products.

Quality control plays a crucial role in the following stages:

1. Procurement of raw materials: Thin layer chromatography, liquid phase chromatography and IR fingerprint spectrum technology are applied to control the locality, species and processing of each batch of raw materials in order to ensure their authenticity. IR fingerprinting compares every single batch against the established standard.

2. Production process: IR fingerprinting compares each batch of intermediate and finished products against the established standard for each product. To complete the quality control procedure and ensure that quality is maintained throughout the course of production, regular testing is carried out to determine consistency of the production process as well as to ensure product uniformity and stability from batch to batch. Product effectiveness can thus be safeguarded.

Universal criteria for fingerprint testing benchmarks recognise that products exhibiting at least 90% similarity in comparison with standard fingerprints are considered as meeting the required norm. Kang Ren Tang uses these criteria during its fingerprint testing controls to ensure that raw materials come from traditionally authentic areas of cultivation and that the best-quality plant species are accurately identified and correctly processed.

What is the infrared fingerprint spectrum technique?
Infrared (IR) spectroscopy is a powerful analytical tool in the chemical fingerprinting of materials and is an established and widely used test in the Western pharmaceutical industry. Any sample material that will interact with infrared light produces a spectrum and the technique can be used to examine samples in liquid, solid or gas phase. The right area of the spectrum, in the range 1500 to 500 cm\(^{-1}\), normally contains many peaks and troughs of varying intensities.

This complex region is also known as the “fingerprint region” — just as human fingerprints uniquely identify their owner, so infrared spectroscopy provides a spectral fingerprint that uniquely identifies a particular chemical compound. Identity of the sample can therefore be confirmed by comparison of this region to a known spectrum. Fingerprinting is superior to other analytical methods because no two compounds have the same infrared spectrum.

The IR fingerprint spectrum technique has two main features in relation to the testing of materia medica:

1. Every materia medica has a different fingerprint depending on its locality and species and the methods employed in its processing — this is its specific feature. The fingerprint of a particular materia medica originating from the same locality and species and processed
correctly according to the same method is consistent across different samples — its specific feature can therefore be replicated.

2. IR fingerprint spectra focus on the complete qualitative information related to a particular materia medica rather than on specific target ingredients. This conforms to the holistic concept of traditional Chinese medicine.

These two IR fingerprint spectrum features are not only used for the differentiation of materia medica but also in the quantification and production of FCGs. The traditional decoction is set as the standard and the granules as the test sample, with IR spectrum fingerprinting then applied to compare the two. The optimal decoction extraction technique — that is, cooking individually (dan jian) or cooking together (gong jian) — is determined when the fingerprint of the granule sample matches that of the traditional decoction.

TLC and liquid chromatography both focus on target ingredients, but it is not possible to determine the authenticity of materia medica by the content level of a target ingredient. For example, the level of chlorogenic acid contained in *Shan Yin Hua* (Flos Lonicerae Confusae) and *Jin Yin Hua* (Flos Lonicerae Japonicae) both reach the level required by the Chinese Pharmacopoeia standard. Therefore, based on the content, the two types of materia medica cannot be differentiated. However, the IR fingerprint spectrum technique can immediately identify whether a sample of *Jin Yin Hua* is authentic when compared with a standard sample. This is important because according to the latest edition of the Chinese Pharmacopoeia, *Shan Yin Hua* does not meet the criteria for the amount and size of flower buds; although it is cheaper, it is not as clinically effective as *Jin Yin Hua*.

**How is the authenticity of raw materia medica guaranteed?**

1. **Locality**

A major effort has been put into comparing the quality of each materia medica from each production locality. If we take *Zhi Shi* (Fructus Immaturus Citri Aurantii) as an example, the Chinese Pharmacopoeia only tests for synephrine, but not for the active ingredient naringin. As a result, *Zhi Shi* meets the requirement for synephrine at each production locality, but only *Zhi Shi* from authentic localities in Xingan county of Jiangxi Province contains naringin and therefore meets the IR fingerprint spectrum raw material comparison criterion of 90% similarity. Kang Ren Tang only uses *Zhi Shi* produced in Xingan county.

2. **Species**

Research has also been carried out comparing the quality of materia medica from each species. If we take *Gan Cao* (Radix et Rhizoma Glycyrrhizae) as an example, in the past the most commonly used species were *Wu La Er Gan Cao* (Glycyrrhiza uralensis Fisch.)
harvested in Inner Mongolia and *Zhang Guo Gan Cao* (*Glycyrrhizae inflata* Bat.). However, in recent years the production volume of *Zhang Guo Gan Cao* from Xinjiang has increased because of its high glycyrrhizic acid content. This has the result that in some parts of Xinjiang, this herb is now exhausted. However, although Xinjiang *Zhang Guo Gan Cao* does indeed have a high glycyrrhizic acid content, its liquiritin content is very low. In fact, since both the glycyrrhizic acid content and the liquiritin content of *Wu La Er Gan Cao* are high and meet the standards of the Chinese Pharmacopoeia, we use this species for preparing our granules and for comparing with the *Gan Cao* fingerprint standard.

### 3. Processing method

Taking *Shu Di Huang* (Radix Rehmanniae Conquita) as an example in this category, after *Sheng Di Huang* (Radix Rehmanniae) has been processed into *Shu Di Huang*, its polysaccharides break down into monosaccharides. This is reflected in the IR fingerprint spectrum where a single peak breaks down into a double peak; insufficiently-cooked *Di Huang* retains its single peak. This indicates that the IR fingerprint spectrum technique can be used to differentiate between those materia medica that have been processed correctly and those processed incorrectly.

**What hygiene standards apply to FCGs?**

FCGs are produced in a 300,000 degree air purification workshop, thereby avoiding the need for the addition of preservatives. Each product batch undergoes hygiene testing to ensure that it meets the hygiene standards of the Chinese Pharmacopoeia. Kang Ren Tang granules are stored in aluminium-film multi-liner packaging at normal temperatures, ensuring quality stability and proof against dampness for 5 years.

**How do FCGs differ from ordinary granules?**

Ordinary granules, those most commonly available currently in the market, are manufactured in a 5:1 yield ratio. Also known as the concentration ratio, this ratio expresses the relationship between the raw herbs and the finished product, indicating that 5 grams of raw herb yield 1 gram of granules. The natural concentration ratio of granule products tends to vary from item to item because some substances naturally have more water-soluble material than others. Such herbs require more than 5 grams to produce 1 gram of granules and therefore additional filler materials must be added to adhere to a uniform 5:1 concentration ratio.

Ordinary granules tend to be produced from extracts derived by cooking individual materia medica separately (a process known as cooking individually, *dan jian*), whereas traditional herbal decoctions are generally based on cooking a combination of materia medica together (a process known as cooking together, *gong jian*). Therefore, Kang Ren Tang has had to devise a variety of production techniques designed to capture the essential characteristics of each materia medica, whether it is cooked individually or together, in order to allow FCGs to achieve an equivalent effect to that of traditional Chinese herbal decoctions.

The company has thus achieved a major advance in the current situation of a standard 5:1 ratio for all granules. In addition, the use of a dry granulation process avoids the need for additional filler materials except in a very few cases.
How has the issue of cooking materia medica individually or together been resolved?
The difference between cooking materia medica individually or together depends on the cooking environment of each materia medica. This becomes clearer if we take the example of *Fu Ling* (Poria) within *Si Jun Zi Tang* (Four Gentlemen Decoction). In a decoction of this formula, *Fu Ling*’s solvent is the liquid extracted from the decoction of the other three materia medica in the formula (*Ren Shen*, *Bai Zhu* and *Zhi Gan Cao*). When cooked on its own, *Fu Ling*’s solvent is water. The different cooking environments result in different substances in the decoction extracts.

Previous research has focused on the type of solvent characteristics found in common combination environments and on possible chemical reactions such as oxidation-reduction and acid-base neutralisation — these are the main chemical reactions that occur irrespective of the materia medica combinations used. In contrast, Kang Ren Tang has developed its production techniques and procedures to provide a cooking environment equivalent to that of cooking materia medica together in order to achieve the same effect as that of traditional decoctions. It has carried out this research into each and every materia medica in its range to arrive at the best possible equivalence of effectiveness.

How has the issue of using the same materia medica in different formulas been resolved?
If the action of the same materia medica in different formulas varies as a result of a change in the active ingredient, then different production techniques must be used. This can be seen from the example of *Da Huang* (Radix et Rhizoma Rhei). Cooking *Da Huang* together with other herbs or, alternatively, adding it towards the end of the decoction process results, respectively, in the breaking down or the retention of anthraquinones (temperature-sensitive constituents of the herb), which in turn leads to different purgative actions. Different production techniques are therefore required for these two categories of *Da Huang*, resulting in two types of FCGs. *Da Huang* cooked together is produced at a temperature of 100°C at normal pressure, thereby breaking down the temperature-sensitive anthraquinones to reduce the herb’s purgative effect; *Da Huang* “added towards the end” (*hou xia*) is produced at a temperature of 60°C at normal pressure, thereby enabling the anthraquinones to be retained and the herb’s purgative effect ensured.

However, the same production technique is employed if the action of a materia medica is not the same in different formulas, but where this variation occurs as a result of different active ingredients produced due to different combinations of materia medica rather than due to a change occurring in the active ingredients themselves. *Dan Shen* (Radix Salviae Miltiorrhizae) is a good example of this. Modern studies indicate that the herb’s action of invigorating the blood results mainly from its fat-soluble ingredients such as tanshinone IIA, whereas its action of cooling the blood is due to its water-soluble ingredients such as danshensu. In its traditional use in decoctions, *Dan Shen* does not require different cooking methods and cooking environments just because it contains different types of active ingredients. Our studies revealed that high-temperature cooking can also release the herb’s fat-soluble active ingredients. Therefore, based on customary usage, only the traditional water extract technique is needed to produce *Dan Shen* FCGs.
Is the cooking method for FCGs the same as for traditional decoctions?
FCGs are produced by imitating the cooking method for traditional decoctions and integrating it with modern production techniques.

- The production technique for liquid extracts destined for these granules is designed in accordance with the requirements for cooking traditional decoctions such as the volume of water required, the soaking time, the number of times the decoction should be cooked, the length of time required for cooking, whether the materia medica should be cooked first or added towards the end of the cooking time, and whether the materia medica need to be wrapped for cooking, melted or dissolved in the decoction, cooked separately, or taken after infusion in the decoction. Modern technology is employed after determination of the production technique applicable to each product.
- For products with fat-soluble constituents, the pharmacologically active constituents have been defined via the chemistry and pharmacology of Chinese materia medica and research into the different concentrations of alcohol extracts and different pH solvent extracts. This has enabled the active ingredients of this type of product to be retained to the greatest possible extent, thereby making it the equivalent of, or the nearest approximation to, a traditional decoction.
- For products that are traditionally ground finely for use as medicines or in pills or powders, application of the ultrafine pulverisation technique destroys the cell walls of the medicinal material to produce a very fine powder, which increases the material’s solubility and bio-availability and allows its clinical effectiveness to come into play more rapidly.
- FCGs are manufactured using high-performance vacuum concentration and spray-drying granulation.
- Granulation is performed by drying without the addition of excipients except in a very few instances where the product would not otherwise granulate (in such cases, the minimum amount of auxiliary material is added). This differs from the procedure used for patent medicines, where a large proportion of sucrose or other additives are used. FCG Full Composition Granules are sugar-free.

How does the production technique reflect materia medica needing to be “cooked first” (xian jian)?
Cooking first requires an increase in the length of cooking time for materia medica that are to be made into FCGs. Prolonging the cooking time aims to raise the amount of active ingredients dissolved in the cooking water and reduce any toxicity so that the materia medica can fully achieve its effect. Examples include the mineral Shi Gao or the potentially toxic Cao Wu/Chuan Wu, all of which require cooking first. Granules based on the liquid extract from cooking Cao Wu/Chuan Wu for more than two hours are equivalent to the decoction liquid produced by the patient cooking the raw herb first at home.

How does the production technique reflect materia medica needing to be “added later” (hou xia)?
Adding materia medica later (towards the end of the decoction process) requires a reduction in the cooking time for materia medica that are to be made into FCGs. There are two types
of materia medica which need to be added later — those containing volatile ingredients and those whose active ingredients are unstable when exposed to heat. The aim of adding these materia medica later during decoction is to protect the volatile ingredients and avoid damage to the active ingredients.

For aromatic materia medica containing a high proportion of volatile ingredients such as Bo He (Herba Menthae), Jing Jie (Herba Schizonepetae), Qiang Huo (Rhizoma et Radix Notopterygii) or Sha Ren (Fructus Amomi), the volatile oils are collected first. Water is then added to start the extraction procedure. The volatile oils are wrapped by cyclodextrin and added to the granules after they have been stabilised, thus avoiding volatility and ensuring stability of the volatile ingredients.

For those materia medica whose active ingredients are unstable when exposed to heat, such as Da Huang, they are extracted and concentrated at a low temperature (60°C) to avoid decomposition of the purgative constituents (anthraquinones) at high temperatures.

How does the production technique deal with cooking over low or high heat?
Cooking time and temperature should not be excessive or too intense. The ancients had their own rules for cooking depending on the type of materia medica and its effect. For example, materia medica to release the exterior (biao yao) were cooked, on the basis of their nature, rapidly and over a high heat, whereas supplementing materia medica (bu yao) were cooked, on the basis of their taste, slowly and over a low heat.

Many exterior-releasing herbs are aromatic with volatile constituents — therefore only a small amount of water is needed for cooking, heat should be high and the cooking time short, thereby preserving the aromatic nature of the decoction extract and producing a strong and quick-acting diaphoretic effect.

Many supplementing and regulating herbs, as roots and stems, are tough and cloying, making it more difficult to extract the active ingredients quickly — therefore a large amount of water is needed for cooking and high heat is used to bring the decoction to the boil. After this, the heat is lowered so that the herbs are cooked for a comparatively long time, thereby producing a fairly concentrated decoction with an obvious, persistent supplementing effect.

By controlling the pressure and heat at which the decoction is cooked, FCGs take full account of different cooking times and temperatures.

How can the production technique ensure that toxins are eliminated from materia medica?
There are two methods of eliminating toxins:
1. Elimination of toxicity during processing: For example, Ku Xing Ren (Semen Pruni Armeniaceae Amarum) is slightly toxic in its raw form. The herb is therefore cooked initially in water, then stir-fried after drying. Toxins are eliminated during cooking through a process known as destroying the enzymes (prunase and amygdalase) while preserving the glucosides (amygdalin).
2. Elimination of toxicity after processing: In certain instances, some toxins remain after processing and it is necessary therefore to cook the herb separately first in order to reduce toxicity to safe limits. For example, Cao Wu/Chuan Wu is decocted for an extended period to ensure that as much toxicity as possible is eliminated.
Does concentration destroy active ingredients?
The decoction liquid extracted during processing is concentrated in a high-performance vacuum concentration unit. With this procedure, evaporation levels are high, the temperature can be kept low and the concentrated decoction is exposed to heat for the shortest possible time, thereby avoiding the problem of active ingredients being exposed to high temperatures for a long period. Low-temperature concentration is used for heat-sensitive products. Therefore, the concentration process does not destroy active ingredients.

Does the drying process affect active ingredients?
Drying is carried out mechanically in a centrifugal spray-drier. The concentrated decoction to be dried is dispersed into very fine mist-like particles, which increases the surface area of moisture dispersal and speeds up the drying process. When these particles come into contact with hot air, a large proportion of the moisture content is removed immediately, allowing the decoction to be dried into a powder. By exposing the particles to heat for a fraction of a second only, lengthy exposure to high temperatures that could destroy active or heat-sensitive ingredients is avoided.

What are the advantages of dry granulation?
With the traditional wet granulation method, large amounts of sucrose and dextrin are added to a materia medica extract and mixed together into granules before being dried. This means that considerable quantities of additional materials must be used, greatly increasing the dosage for the patient.

In dry granulation, a dry pressure granulation machine directly presses spray-dried powder into lumps, which are then crushed into granules. The granulation process is straightforward and does not require the addition of other materials except for a few substances that cannot be granulated directly and require additional processing with small amounts of extra materials.

Dry granulation has the following advantages over wet granulation — much less additive required, better protection against moisture, greater density consistency, better flow characteristics, greater quality stability, and simpler production technique. In addition, the heat required to dry granules after wet granulation destroys some active ingredients; hence dry granulation overcomes this problem.

How do FCGs differ from granules produced in Japan and Taiwan?
Japanese granules, known as Kampo granules, are based on classical formulas. They can only be modified by addition and therefore do not conform to the Chinese tradition of flexible formula modification. Granule quality control is based on testing of one or several active ingredients through the application of thin layer chromatography (TLC) for qualitative analysis and liquid chromatography for content determination. Furthermore, Chinese materia medica processing techniques (pao zhi) enjoy international protection; Japanese granules are only produced from raw materia medica.

The production technique for granules in Taiwan is an advance on that used in Japan. Crushed materia medica are added to the decoction, which is then treated as an adhesive agent to produce the granules. Strictly speaking, this is really a powder.
FCGs have achieved a level of effectiveness conforming to that of traditional decoctions rather than focusing only on a high extraction rate of a particular active ingredient. These granules revolutionise the concept of traditional decoctions while maintaining the characteristic TCM feature of flexible modification according to patterns.

How should FCGs be taken?

As an infusion
FCGs are best taken infused in water that has just boiled. Place the granules in a cup and, for a standard prescription of 10-12 grams of granules, add 100-150 ml of the water. Stir thoroughly to distribute the mixture evenly and allow it to infuse. Let the mixture cool somewhat until it can comfortably be swallowed. As with raw herb decoctions, the herbal medicine should be taken twice a day or otherwise as directed by the prescribing practitioner. For the patient, this is as convenient as taking patent medicines, but it has the advantage that the practitioner can adjust the prescription to individual requirements.

Swallowing with water
Place the granules directly in the mouth and swallow with warm water.

As a decoction
Granules can be decocted briefly rather than being infused, but decoction is not recommended for prescriptions containing volatile ingredients for clearing heat and releasing the exterior. There is little difference between the two methods except that brief decoction may help the granules to dissolve more thoroughly.

Taking less soluble substances
Some prescriptions may contain less soluble substances with sediment settling at the bottom of the cup when the mixture cools slightly. These substances also contain active ingredients and must be taken with the infusion liquid to ensure they are effective. Insoluble substances in prescriptions arise because for most materia medica the extraction process requires a high temperature and subsequent infusion in boiled water for a short time only is not long enough for all the extracted constituents to dissolve completely. On rare occasions, there are some costly substances that are crushed before being added to a prescription and these will not dissolve completely in an infusion. Therefore, when taking granules containing these substances, the longer time they are given to dissolve the better.

External application
FCG sachets can be used externally as well as internally. For external application as a wash, we generally recommend adding 20 times as much boiling water as for internal use.

Are FCGs suitable for patients with diabetes and high cholesterol levels?
FCGs are produced by drying and do not contain any additives such as sucrose. They can therefore safely be taken by those suffering from diabetes, obesity or high cholesterol levels.
AUTOMATED DISPENSARY SYSTEM AND PRESCRIPTION SERVICES

The automated dispensary system consists of computer terminals, sealed individual bar-coded granule containers stored in pigeon-holes within cabinets, granule dispensing machines and a sachet sealing apparatus. Prescriptions are dispensed in Donica Health’s recently-established “clean room” facility, which offers the best guarantee of hygiene and quality.

How does the system work?

- Based on the results of the patient consultation, the practitioner (an authorised health professional) prescribes a herbal formula appropriate to the patient’s condition. This prescription is written out using the traditional decoction quantities applicable to the raw herbs selected.
- The practitioner then submits the prescription to Donica Health via email or fax — see “How to use Donica Health dispensary services” later.
- Once Donica Health has received the prescription, it will be input into the dispensary computer, which will automatically convert the dosage for each herb into the correct granule amount using the appropriate equivalence factor.
- The computer automatically checks the prescription against the “eighteen incompatibilities” (shí bā fàn) and “nineteen antagonisms” (shí jiǔ wèi) as well as for potentially toxic dosages. In case of query, the prescription will be confirmed with the practitioner before dispensing continues.
- The computer then activates an indicator light beside each granule container for each herb included in the prescription.
- The dispensary assistant selects the number of sachets required (based on two sachets per daily dose unless otherwise specified) and attaches them to a sachet drum, which is then inserted into the granule dispensing machine.
- The dispensary assistant selects each container in turn and scans its bar code at the dispensing machine. Once the bar code has been accepted, the container is inserted into the dispensing nozzle and the machine then dispenses the correct amount of the granules into each sachet. This procedure is followed for each herb in the prescription.
- The computer automatically detects an operator error if the correct procedure has not been followed (for example if the assistant forgets to scan the container’s bar code or selects the wrong container) and then notifies the assistant accordingly. If the assistant inserts a wrong container and tries to press the dispensing button, the machine will stop working. This avoids system and operator errors and ensures that the correct herbs are dispensed.
After all the granules have been dispensed, the dispensing drum is extracted and the sachets are removed and inserted individually into the sachet sealing apparatus where they are hermetically sealed.

The sachets are then placed ready for despatch into handy-sized packs designed to fit through standard letter-boxes. Full instructions for use are included on the box.

The whole dispensing procedure takes 6-8 minutes on average.

How to use Donica Health dispensary services

1. Log in to your account on our website www.donicahealth.co.uk. Our dispensary services are only available to authorised health professionals who have previously registered with Donica Health.
2. Click on Dispensary Services on the Dispensary drop-down menu to access the online email facility (www.donicahealth.co.uk/index.php/dispensary-services/).
3. From the Herb List page (www.donicahealth.co.uk/index.php/dispensary/herb-list.html), click on the link to open up the pdf herb list.
4. Copy over codes and names of the herbs needed and add the dosage required (based on traditional decoction quantities) in the Herb Name and Weight section. Please also state the total number of days required. Daily doses will be equally divided into two sachets unless otherwise specified in your email.
5. Fill in your name, email and mobile telephone number (we may need to contact you by text message in relation to your prescription).
6. Press the Submit button.
7. You can also order a prescription by sending an email to dispensary@donicahealth.co.uk (please include all the details mentioned above) or by faxing 01707 707022.
8. Your prescription will be processed on receipt and the granule sachets packaged and despatched to you on the same day or the next working day, depending on the time your order is received.

Can I dispense FCGs to my patients in my own clinic?

Yes. Although we strongly recommend that dispensing is carried out in Donica Health’s “clean room” facility with its quality and hygiene guarantees, we can supply you with our granule equivalence sheet and whichever FCGs you wish to order (available in 100g bottles). You can then combine these granules into a prescription and dispense them to your patients as required.

The automated dispensary system can also store data on your own commonly-used empirical formulas and prepare them on your behalf so that you can then have some boxes of sachets in reserve to give your patients as required.

Can the dispensary service be used for classic formulas?

Since it is difficult for herbalists under the current UK legal framework to gain access to patent herbal medicines in pill or tablet form, it is possible to request that FCGs be made up into a classic formula. These are then dispensed as granules through our automated dispensary system, which calculates the required quantity in grams per sachet (the quantity will be stated on the box). Each gram is equal to 2-4 concentrated tablets or 6-8 concentrated pills of patent medicines. Patients should take one sachet once or twice a day as directed by
their practitioner, depending on their condition. Your sachet order will be placed in a handy-sized box for delivery to you. Please note that, unlike pills or tablets, our pure granules do not contain any additives such as sugar or starch.

**What is the equivalence factor?**

Equivalence factor refers to the quantity of raw herbs required to produce 1 gram of Full Composition Granules. For example, the equivalence factor for *Sheng Gan Cao* (Radix et Rhizoma Glycyrrhizae Recens) is 5, which means that 1 gram of granules corresponds to 5 grams of the raw herb. Therefore, if a practitioner’s prescription includes 10 grams of *Sheng Gan Cao*, this is the equivalent of prescribing 2 grams of a *Sheng Gan Cao* FCG.

Two further examples with different equivalence factors should help to make the calculation method clearer. *Bai Shao* (Radix Paeoniae Alba) has an equivalence factor of 20, which means that 1 gram of granules corresponds to 20 grams of the raw herb. *Fang Feng* (Radix Saposhnikoviae) has an equivalence factor of 10, which means that 1 gram of granules corresponds to 10 grams of the raw herb. Therefore, if a practitioner’s prescription includes 10 grams of *Bai Shao* and 10 grams of *Fang Feng*, this is the equivalent of prescribing 0.5 gram of a *Bai Shao* FCG and 1 gram of a *Fang Feng* FCG.

To calculate the quantity required for any herb granule, use this simple conversion method:

\[
\text{FCG amount (g)} = \frac{\text{Prescribed amount of raw herb (g)}}{\text{Equivalence factor}}
\]

When a practitioner writes out a prescription using traditional amounts of raw herbs, our automated dispensary system uses the appropriate equivalence factor to calculate the corresponding amount of the FCG in order to make up the granule prescription.

A list of FCGs with their appropriate equivalence factor can be accessed from www.donicahealth.co.uk/index.php/dispensary/herb-list.html.

**How does the equivalence factor affect price comparison with other granules?**

Granule prices from other suppliers are usually based on the “industry standard” 5:1 ratio. Hence, the equivalence factor needs to be taken into account when making a comparison between prices. For instance, where a herb has an equivalence factor of 20, the price per gram of an FCG granule will typically be somewhere in the region of four times that of an “industry standard” granule. This is because, for an FCG granule with this equivalence factor, a prescription will only require 25% of the amount of an “industry standard” granule.

An illustration of the granule equivalence calculation for some well-known herbal prescriptions can be found on the inside front cover of this guide.
FCG

Full Composition Granules

- Clinically as effective as traditional decoctions
- Automated dispensary system
- GMP certified
- Patented production technology
- Advanced quality control methods with IR fingerprinting
- Best choice for patients and health professionals

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