

# LILY PRESERVE METAL FORMULA *Bai He Gu Jin Tang*

ORIGINS: Ming Dynasty  
from *Writings for Posterity*  
by Zhou Shen-Zhai.

**Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) is a Ming Dynasty formula from *Writings for Posterity* by Zhou Shen-Zhai.

## GENERAL SIGNS/SYMPTOMS

**Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) was originally designed to treat consumptive disorders of the respiratory system characterized by lung weakness and dryness with underlying kidney yin deficiency. Today it is used for multiple issues arising from yin deficiency affecting the lungs. General signs and symptoms include wheezing and asthmatic breathing, blood-streaked sputum, chronic dry throat and/or lips, chronic dry cough, and many post-febrile illness presentations where heat has damaged the yin of the kidneys or lungs.

## ACTIONS

1. Nourishes the yin of kidney and lung
2. Clears full and empty heat, drains fire
3. Transforms phlegm and stops cough
4. Supports qi and generates fluids
5. Calms and protects the heart

## INGREDIENTS

PINYIN	LATIN	ENGLISH	PERCENT OF FORMULA
<i>Bai He</i> (chief)	<i>Lilium lancifolium</i> Bulbum	Lily Bulb	22.2%
<i>Shu Di Huang</i> (chief)	<i>Rehmannia glutinosa</i> Radix Preparata	Prepared Rehmannia Root	16.6%
<i>Sheng Di Huang</i> (chief)	<i>Rehmannia glutinosa</i> Radix	Rehmannia Root, unprepared	11.0%
<i>Xi Yang Shen</i> (deputy)	<i>Panax quinquefolii</i> Radix	American Ginseng Root	8.3%
<i>Mai Men Dong</i> (deputy)	<i>Ophiopogon japonicus</i> Tuber	Ophiopogon Tuber	8.3%
<i>Xuan Shen</i> (deputy)	<i>Scrophularia ningpoensis</i> Radix	Scrophularia Root	5.6%
<i>Chuan Bei Mu</i> (assistant)	<i>Fritillaria cirrhosa</i> Bulba	Sichuan Fritillaria Bulb	5.6%
<i>Dang Gui</i> (assistant)	<i>Angelica sinensis</i> Radix	Angelica Root, Tangkuei Root	5.6%
<i>Bai Shao</i> (assistant)	<i>Paeonia lactiflora</i> Radix, Alba	White Peony Root	5.6%
<i>Jie Geng</i> (assistant)	<i>Platycodon grandiflorus</i> Radix	Platycodon Root	5.6%
<i>Gan Cao</i> (envoy)	<i>Glycyrrhiza uralensis</i> Radix et Rhizoma	Chinese Licorice Root & Rhizome	5.6%

## GENERAL INDICATIONS / MODERN APPLICATIONS

- Anxiety, especially at night
- Asthma
- Bronchitis, chronic
- COPD
- Cough, blood-streaked
- Cough, dry
- Cough, during pregnancy
- Cough, with sticky sputum
- Dry mouth/lips/nose
- Influenza, post-illness with damage to yin
- Insomnia, post-illness with damage to yin
- Night sweats
- Palms/soles hot
- Pharyngitis
- Pneumothorax, spontaneous
- Restlessness
- Thirst
- Throat, dry
- Wheezing

## FORMULA DISCUSSION

**Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) was originally formulated to help the lungs recover from damage suffered by consumptive disorders. The class of “consumptive disorders” is characterized by fire damage to the lung yin, with an inability to recover on its own, because the kidney yin is also damaged. Without sufficient yin resources, the kidney is unable to supplement the yin of the lungs. This formula is therefore appropriate for all yin deficiency disorders affecting the lungs where there is smoldering fire.

The lungs have a descending function as well as a dispersing function. Part of the descending function of the lung is to fan the *mingmen* fire. But another aspect of the descending function of the lung is to descend yin to nourish the kidneys. The latter aspect of the descending function of the lungs is not much talked about these days. The way it works is this:

The potential for postnatal yin is taken in by the body as food and drink. The stomach breaks it down and begins separation, then sends the chyme to the small intestine, which further separates and refines. While in the small intestine, the spleen goes to work, using its ascending function to send the stomach fluids and *gu qi* (the qi created during the

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**TONGUE**

Red, possibly small, with thin dry coat or mirror coat.

**PULSE**

Thin and rapid.

**CONTRAINDICATIONS / CAUTIONS**

This formula consists chiefly of tonics and is therefore not appropriate for the acute phase of most illnesses, especially externally-contracted acute illness. Also, as is typical with yin tonics, some of the substances may be difficult to digest for persons with weak spleen qi. If the patient has marked spleen qi weakness with poor digestion, take with single tablet of **Astragalus Formula**, **Ginseng & Astragalus Formula** or **Sea of Qi Formula**, as appropriate.

**DOSAGE**

2 tablets 3 times a day is usually sufficient for an adult.

digestive process) upward. “Earth generates metal;” therefore, spleen supports lung. The way that the fresh qi gets distributed to the various areas of the body is not via the spleen directly, but via the lung, as commander of the qi. Since the directionality of the spleen is upward,<sup>1</sup> while the lung’s is downward (descending) and outward (dispensing), it is the job of the lungs to descend the yin aspects of the *gu qi* downward to the kidneys. This yin nourishes the kidneys and, what the kidneys do not require that day for their own nourishment and support, they bank as yin reserves for all the other organs.

Perhaps the preeminent application of these yin reserves is to compensate for deficiency fire wherever it occurs in the body. This is a fundamental expression of the principle: “water controlling fire.” The kidney will supply yin in an effort to control the spread of fire. The mutually supporting relationship between lung and kidney can be clearly seen in this context. If the lungs become damaged from fire (febrile disease or chronic yin deficiency) they cannot descend yin to the kidneys; if the kidneys lack yin reserves, they cannot cool the lungs to control the fire and cannot sufficiently nourish the lung tissue to help it recover. The condition is thus perpetuated in a vicious cycle.

**Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) is designed to resolve this situation. The formula’s strategy assumes that the digestive function is intact and concentrates its focus on nourishing the lung yin and restoring the yin reserves in the kidney. It also effectively drains both excess and deficiency fire from the lungs and protects the heart from the pathological influences of fire in the upper burner.

**SYNERGY OF INGREDIENTS**

The version of **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) under discussion here is nearly identical to Zhou’s original formulation, with one important exception: American ginseng (*xi yang shen*) has been added. American ginseng (*xi yang shen*) was not added to the official *materia medica* until the mid-18<sup>th</sup> century and so it was unknown to Zhou, who lived in the 16<sup>th</sup> century. But once American ginseng (*xi yang shen*) was introduced to Chinese herbalists, it was quickly embraced as a necessary inclusion in the treatment of consumptive disorders. It is believed that had American ginseng (*xi yang shen*) been available to Zhou when he formulated **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*), he certainly would have made it a part of this formula. Many qi tonics are able to generate fluids; American ginseng (*xi yang shen*) is the only one that is cold, and therefore it is the most appropriate tonic for restoring damage to the qi when there is smoldering fire. It enters the heart, lung, and kidney, drains fire, nourishes yin, and supports the qi. But since qi deficiency is not the primary concern in this pattern, American ginseng (*xi yang shen*) is not the chief herb in the formula.

There are actually three chief herbs in this formula. The formula’s name is derived from the lily bulb (*bai he*), which enters the heart and lung and concentrates the action of the formula in the upper burner, especially the lungs and throat. But the two rehmannias, *sheng di huang* and *shu di huang*, focus their actions on the kidneys. Altogether, these three herbs work synergistically to clear heat, moisten dryness, nourish yin, and generate both metal and water in order to restore their mutually supportive relationship. All three also enter the heart to clear heat, drain fire, and eliminate irritability and restlessness. The rehmannias both enter the blood. This is especially important in consumptive disorders, where there may be blood in the spu-

tum. The unprepared rehmannia (*sheng di huang*) is the strongest in the formula to cool heat and drain fire. It is arguably the most important or at least the most prescribed herb in the Chinese *materia medica* to treat patterns of exhausted yin, insufficient fluids, and blood heat from fire damage. The prepared form of rehmannia, *shu di huang*, enters the blood even more directly than the unprepared form. It is classified as a tonic and can, in fact, help to restore blood that has been consumed by the fire, as well as control bleeding from reckless blood. It is frequently combined with *sheng di huang* to restore yin, blood, and fluids damaged by fire.

American ginseng serves as one of three deputies in this formula. The two other deputies are scrophularia (*xuan shen*) and ophiopogon (*mai men dong*). Ophiopogon (*mai men dong*) combines in this formula mainly with the lily bulb (*bai he*) while the scrophularia (*xuan shen*) combines with the two rehmannias. Ophiopogon (*mai men dong*) nourishes the yin and generates stomach fluids to benefit the lung. It reaches the throat to moisten dryness and it moistens the intestines, which helps the lung clear heat through its yang counterpart: the large intestine. Like unprepared rehmannia (*sheng di huang*), scrophularia (*xuan shen*) is listed in the “clear heat” category of modern *materia medicas*. Also like *sheng di huang*, it has a strong action to nourish yin and cool blood. It works in combination with ophiopogon (*mai men dong*), platycodon (*jie geng*), and lily bulb (*bai he*) to benefit the throat by clearing heat, moistening dryness, and freeing the throat from stagnation. Scrophularia (*xuan shen*) combines with lily bulb (*bai he*) and platycodon (*jie geng*) to resolve residual phlegm lingering in the lungs.

One of the four assistants, angelica root (*dang gui*), is today a principal herb used in gynecology and hematology. But in the early Han Dynasty, in the days of the legendary Shen Nong, it was primarily used to treat cough and counterflow qi. When the *Shen Nong Ben Cao* (*Divine Farmer’s Classic of Materia Medica*) was composed, it was not yet customary to list the channels entered by the herb, so it is not clear that it was thought to enter the lung channel in its capacity to stop cough and correct counterflow. Later scholars reasoned that it did not need to enter the lungs in order to have these benefits. They argued that entrance into the heart to clear heat and into the liver to cool and invigorate blood could effectively stop the counterflow qi in the chest. This is because one type of counterflow qi that causes cough is due to fire attacking the upper burner, which disturbs the heart and causes the blood to move recklessly. Most fire pathogens do wind up entering the blood, and when they do, the

heat winds up consuming some of the moisture in the blood while at the same time converting the qi in the blood into wind. This commonly occurred in consumptive disorders, which frequently presented with blood-streaked sputum. Angelica root (*dang gui*) can be used to generate blood and rectify the movement of blood, thus its ability to treat cough from counterflow qi without necessarily entering the lung channel itself. Combined with another assistant, white peony root (*bai shao*), the angelica root (*dang gui*) strongly protects the metal element from being “insulted” by the wood element. White peony root (*bai shao*) and angelica root (*dang gui*) also combine to nourish blood directly. The sour taste of white peony (*bai shao*) helps to soften and restrain the liver to prevent any pathological excesses, such as overacting on the spleen, liver yang rising, and, as we just stated, liver insulting lungs. It is a commonly used herb to restrain the stirring of liver wind when the yin has been damaged. It is therefore frequently used for the recovery phase of febrile illness as an assistant.

The other two assistants in **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) are mainly included for their ability to resolve the lingering cough. Both of these herbs are commonly used in acute illness but are used in the chronic phase to treat the symptoms. Sichuan fritillaria bulb (*chuan bei mu*) transforms phlegm and stops cough. It is popular to use for chronic cough because it can moisten dryness and protect the yin as well as resolve phlegm. Fritillaria bulb (*chuan bei mu*) can disperse clumped heat in the lungs and free them from constraint. Platycodon (*jie geng*), the other assistant, can moisten and free the throat in addition to its action to resolve phlegm and stop cough. It is sometimes used in formulas as an envoy to direct the formula to the lungs. It is frequently combined with fritillaria bulb (*chuan bei mu*) to free the lung qi and stop cough.

Licorice root (*gan cao*) is usually considered to be the envoy in this formula because of its sweet harmonizing action, but it can also be seen as another assistant because it has actions to clear heat and resolve fire toxin as well as to moisten the lung and stop cough.

## MODERN RESEARCH

*Cough During Pregnancy*.—A 2020 study using clinical observation looked at the effects that **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) had on 31 pregnant women presenting with cough. The women in the study were selected by eliminating other known causes for their cough, such as reflux or acute URI. There was no control group. The women were each treated for two

weeks with **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*), which was modified according to individual nuances in their pattern. Of the 31 cases, 4 were “completely cured” and 24 showed “marked improvement;” 3 cases showed no improvement. The total effectiveness rate was 87%.<sup>ii</sup>

*Anti-Tuberculosis*—Over the years there have been many studies looking at the efficacy of **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) in the treatment of tuberculosis. One recent study compared a combination treatment of modern medical anti-tuberculosis drugs plus **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) to a control group which received the modern drug treatment alone, without any herbs. The study looked at several factors, including CBC, erythrocyte sedimentation rate, kidney function, ratio of CD4+ and CD25+ Treg cells and the levels of tumor necrosis factor (TNF)- $\alpha$ , interleukin (IL)-4, IL-6 and IL-12 in peripheral blood and bronchoalveolar lavage fluid, as well as subjective symptoms, in part, using the Leicester Cough Questionnaire score; also sleep issues, and chest pain. There were no significant differences between the two groups in the leukocyte count nor the hemoglobin or platelet levels. But the study group that received the combination treatment showed significantly improved kidney function, erythrocyte sedimentation rate, CD4+ CD25+ Treg cell ratio in bronchoalveolar lavage fluid, cytokine levels, chest pain score and improved sleep.<sup>iii</sup>

*Adjuvant Treatment for Lung Cancer*—A 2015 Chinese study sought to observe the effect of modified **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) combined with chemotherapy on the quality of life of the patients with advanced lung cancer. A total of 120 patients with advanced lung cancer were randomly divided into a control group and a treatment group, each with 60 participants. The control group received chemotherapy (docetaxel and carboplatin), while the treatment group was given **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) in addition to the chemotherapy. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30) and Quality of Life Questionnaire-Lung Cancer 13 (QLQ-LC13) were used to evaluate the changes in the patients' QOL. Compared with the control group, the treatment group showed significantly lower scores on the symptom scales of QLQ-C30 and QLQ-LC13 and significantly higher scores on the function and general health scales of QLQ-C30 (P 0.01).<sup>iv</sup>

In 2007 a Chinese study set out to evaluate the attenuation and synergistic effect of adding **Lily Preserve**

**Metal Formula** (*Bai He Gu Jin Tang*) to a standard chemotherapy regimen of cisplatin plus vinorelbine (NP) for late-stage primary bronchial lung cancer. 60 subjects were randomly allocated into 2 groups of 30. The control group was treated by the NP regimen alone; the treatment group was treated with NP regimen plus **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*). After each group completed 2 cycles of 21 days, the curative effect of each was evaluated. The total effectiveness rate of the study group receiving **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) was 100%; The control group was 36.66%. The remission rate of the tumor was 43.33% and 24.14% in treatment group and control groups, respectively. The total effectiveness rate on increase of body weight was 90.32% in the treatment group and 33.33% in the control group. The total effectiveness rate of KPS scoring was 100% in the treatment group and 46.67% in the control group. The comparison of NK cell, T cell subgroup, level of IL-2 of both groups before and after treatment showed “marked significance” in the treatment group vs control.<sup>v</sup>

*Immunomodulation during acute viral infection*—Severe and fatal cases of acute respiratory infections are often associated with a dysregulation in the body's immune response. The most common factor is the cytokine storm. Influenza A is the most common pathogen associated with triggering the cytokine storm. But most recently SARS-CoV-2 has demonstrated cause for similar concern. Most virus-related pathways involved the Toll-like receptor signaling pathway, JAK-STAT signaling pathway, NF- $\kappa$ B signaling pathway, RIG-I-like receptor signaling pathway, as well as antigen processing and presentation. This suggests an immune response after initial viral infection. For the immune response to be most effective, there are stages when a pathway should be up-regulated and stages when it should be downregulated. A 2021 study looked at the efficacy of several individual TCM formulas and single herbs against each virus-related pathway in COVID-19. They were evaluated by the normalized enrichment score (NES). A positive NES indicates that the pathway is enriched in upregulated genes, while a negative NES indicates enrichment in downregulated genes. The efficacy of each anti-COVID-19 TCM formula was calculated as the sum of the NESs of each TCM in the formula for the pathways. For patients with cytokine storm syndrome, TCM formulae with negative NESs for virus-related pathways were sought; and for immunosuppression, they looked at TCM formulae with positive NESs. **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) was among the top three performing formulae with the highest positive NESs.<sup>vi</sup>

*Spontaneous Pneumothorax*—One of the traditional indications for Lily Preserve Metal Formula (*Bai He Gu Jin Tang*) is the treatment of spontaneous pneumothorax. A 1986 study looked at 15 cases of spontaneous pneumothorax treated with **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) and compared this group to 15 cases treated with Western therapy. The effectiveness rate of the TCM group was 93.3%, compared with 73.3% of the control. Among them, the efficacy of tuberculous pneumothorax (10/11 cases) was 90.9%, while the control (6/10 cases) was 60.0%. The duration of the hospitalization of the TCM group was 18.93 days on average; the control group was 27.85 days. This result showed that the **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) was effective in treating spontaneous pneumothorax, especially when its primary disease was tuberculosis. <sup>vii</sup>

### FORMULA COMPARISONS

#### **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) and **Eight Immortals Formula** (*Ba Xian Chang Shou Wan*)

Both formulas address yin deficiency in the lung-kidney relationship. **Eight Immortals Formula** is more appropriate for treating constitutional yin deficiency, while **Lily Preserve Metal Formula** is more appropriate for treating lung and kidney yin in the aftermath of febrile disease where the yin has been damaged. **Lily Preserve Metal Formula** has a stronger action to resolve sticky phlegm and the general focus of the formula is on the lungs; whereas the **Eight Immortals Formula** focuses on the kidneys and then helps the kidney to send the yin upward to nourish the lungs. Because of the difference in the main organs that these formulas support, **Eight Immortals Formula** can also be used to treat impotence and diabetes mellitus; while the **Lily Preserve Metal Formula** is better suited for lingering illnesses of the upper respiratory system.

#### **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) and **Restore the Lung Formula** (*Bu Fei Tang*)

Both of these formulas are designed to help with recovery from recent respiratory illness and both address the kidneys as well as the lungs. **Restore the Lung Formula** is better suited when the lung pulse is weak or large and empty (indicating depleted qi), while **Lily Preserve Metal Formula** is more appropriate when the pulse is rapid and thin (indicating yin deficiency).

#### **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) and **Zheng Qi Support Formula** (*Zheng Qi Fang*)

Both formulas support qi and generate fluids, but **Lily Preserve Metal Formula** has a strong action to nourish

the yin, while **Zheng Qi Support Formula** supports the yang. Also, the timing differs for when you might use each of these two formulas. **Zheng Qi Support Formula**, though it can be used to recover from illness, is primarily designed to be used before illness strikes, so that the individual's immune system is stronger and better regulated when the pathogen invades. **Lily Preserve Metal Formula** is generally going to be used for the recovery phase of an illness with lingering symptoms in the chest or throat. It has the ability to clear out enduring phlegm and heat. It is a cool/cold formula, while **Zheng Qi Support Formula** is warming.

#### **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) and **Sheng Mai Formula** (*Sheng Mai San*)

**Sheng Mai Formula** is commonly used to help with recovery from damage by summer heat. The damage to qi and fluids in the **Sheng Mai Formula** pattern is going to be more severe than in the **Lily Preserve Metal Formula** pattern, where the damage to the yin prevails. **Sheng Mai Formula** is much stronger to support the qi and is much more warming than **Lily Preserve Metal Formula**, where the yin fire needs to be cooled and drained.

#### **Lily Preserve Metal Formula** (*Bai He Gu Jin Tang*) and **Baked Licorice Formula** (*Zhi Gan Cao Tang*)

Again, both of these formulas are used for the recovery stage of illness. **Baked Licorice Formula** is generally preferred when the illness has affected the heart, often presenting with an irregular pulse. It has a weak action to clear the lungs, while **Lily Preserve Metal Formula** has a strong action to clear the lungs and a moderate ability to support the heart. **Baked Licorice Formula** acts on the blood, the heart, and the vessels; **Lily Preserve Metal Formula** focuses on the mutually supportive lung-kidney connection.

## USEFUL COMBINATIONS

For yin deficiency cough with weak digestion	Combine with <b>Ginseng &amp; Astragalus Formula</b>
For wheezing and weak cough from acute febrile infection with underlying yin deficiency	Combine with <b>Mulberry &amp; Lycium Formula</b>
For chronic weak cough with sticky sputum and weak lung qi	Combine with <b>Restore the Lung Formula</b>
For post-viral dyspnea with yin deficiency	Combine with <b>Lung Defense Formula</b>
For Chronic Obstructive Pulmonary Disorder (COPD)	Combine with <b>Lung Defense Formula</b>
For post-viral insomnia with damage to the yin	Combine with <b>Zizyphus Formula</b>

## ENDNOTES

<sup>i</sup>The other “directionality” of the spleen is, of course “holding in place” or “stabilizing;” this virtue is responsible for strength and tone of the flesh. But since this is not really a “direction” per se, it is not part of the discussion here wherein it is used in comparison to the lung’s “dispersion and descension”.

<sup>ii</sup>Fu LY, Lin J, Yao MY, Niu F, Ma FG, and Wang L, “Clinical observation on treatment of cough during pregnancy with modified Baihe Gujin Decoction,” *Traditional Medicine and Modern Medicine*, 2020 (03)2:117-122.

<sup>iii</sup>Ge HB, Zhu J, “Clinical efficacy of Baihe Gujin Decoction combined with anti-tuberculosis therapy for pulmonary tuberculosis with yin-deficiency and fire-hyperactivity syndrome,” *Journal of International Medical Research*, 2020(85).

<sup>iv</sup>Wang MX, Kuang YX, Liu L, “Effect of modified Baihe Gujin Decoction on quality of life in lung cancer patients,” *Sichuan Medical Journal*, 2012(33)959-961.

<sup>v</sup>Hu D, Yang Q, Liu J. (2007). “The clinical observation of additional Baihe Gujin Fang for attenuation and synergy on topical late stage of lung cancer with chemotherapy,” *Journal of New Chinese Medicine*, 2007(39)81–82.

<sup>vi</sup>Qiao LS, Huang WT, Zhang XL, Guo HY, Wang D, Feng QS, Jin RH, Xie L, Li WM, and Cheng J, “Evaluation of the immunomodulatory effects of anti-COVID-19 TCM formulae by multiple virus-related pathways,” *Signal Transduction and Targeted Therapy*, 2021(6)Fig1B.

<sup>vii</sup>Zhen RC, “Clinical observation on 15 cases of spontaneous pneumothorax treatment with Baihe Gujin Decoction,” *Chinese Journal of Integrated Traditional and Western Medicine*, 1986(5)280-282.

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**LILY PRESERVE METAL FORMULA 8**

NOTES: