Molecular Cancer

REVIEW

Open Access

Traditional Chinese medicine in treating upper digestive tract cancers

Alexis Shiying Huang[1,2†], Jiaying Wu[1,2†], Aftab AMIN[3], Xiu-Qiong Fu[1,2*] and Zhi-Ling Yu[1,2,4*]

Abstract

Upper digestive tract cancers, such as oral cavity, laryngeal, esophageal, and gastric cancers, account for 10% of cancer cases and 14.5% of cancer-related deaths worldwide. Conventional treatments often provide limited survival benefits and are frequently associated with adverse effects and drug resistance. Chinese herbal drugs (CHDs) are widely used in the Far East for managing these cancers. In this narrative review, we summarize current clinical studies (published up to June 2024) on the use of 138 CHDs in the treatment of cancers and precancerous lesions of the upper digestive tract. For cancer treatment, 126 CHDs were tested, all in combination with conventional therapies. Each CHD increased the clinical efficacy and/or reduced the adverse effects of conventional therapies. The five-year survival rate is a critical metric for evaluating the clinical benefits of cancer treatments. Four of the CHDs were reported to increase five-year survival rates of patients receiving conventional therapies. The four CHDs are Sishen Jiedu Decoction, Pingxiao Tablet, Fuzheng Guben Granule, and Buyang Huanwu Tang. For managing precancerous lesions, 12 CHDs were tested: six used alone and six in combination with conventional therapies. Zengshengping is one of the CHDs used alone and is the only one that has been proven to prevent the development of esophageal cancer with convincing evidence. This review provides information about the clinical benefits of CHDs and offers a reference for their rational application in treating upper digestive tract cancers. The reviewed studies have limitations: most trials had small sample sizes and were not multi-center; only one study investigated the mechanisms of action of the studied CHD; and the active components of CHDs were not explored. To promote international recognition of CHDs, rigorously designed studies on clinical outcomes, mechanisms of action, and active components are warranted. Moreover, the studied CHDs should be standardized.

†Alexis Shiying Huang and Jiaying Wu contributed equally to this work.

*Correspondence:
Xiu-Qiong Fu
makyfu@hkbu.edu.hk
Zhi-Ling Yu
zlyu@hkbu.edu.hk
[1] Consun Chinese Medicines Research Centre for Renal Diseases, Hong Kong Baptist University, Hong Kong, China
[2] Center for Cancer and Inflammation Research, School of Chinese Medicine, Hong Kong Baptist University, Hong Kong, China
[3] Division of Life Science, Center for Cancer Research, and State Key Lab of Molecular Neuroscience, Hong Kong University of Science and Technology, Hong Kong, China
[4] Research and Development Centre for Natural Health Products, HKBU Institute for Research and Continuing Education, Shenzhen, China

Introduction

The upper digestive tract encompasses the oral cavity, pharynx, esophagus, and stomach [1]. In 2022, upper digestive tract cancers, including lip and oral cavity, salivary gland, hypopharyngeal, oropharyngeal, laryngeal, esophageal, gastroesophageal junction, and gastric cancers, accounted for approximately 10% of all cancer cases, and 14.5% of cancer-related deaths worldwide (Fig. 1A) [2, 3]. By 2050, the number of upper digestive tract cancer cases is expected to increase by 79%, with a projected 86% rise in associated deaths (Fig. 1B) [4, 5]. The 5-year survival rates among upper digestive tract cancer patients are generally low [6]. Conventional treatments offer limited survival benefits and come with numerous adverse effects and drug resistance [7, 8]. As a result, up to 40% of upper digestive tract cancer patients seek complementary and alternative medicines (CAMs) [9, 10]. Traditional Chinese medicine (TCM), an ancient practice popular in the Far East region, is a typical CAM [11, 12]. Although Chinese herbal drugs (CHDs) have been used to treat diseases, including upper digestive tract cancers, for over 2,000 years [13], the lack of convincing clinical evidence and a poor understanding of their modes of action have led to the perception that their therapeutic benefits are questionable. In this review, we collate and discuss the results from randomized controlled clinical trials and preclinical research that investigate the use of CHDs in the treatment of upper digestive tract cancers, aiming to discern their clinical efficacy and underlying mechanisms of action.

Methods

Data sources and search methods

Papers, published in English or Chinese, were retrieved from PubMed, MEDLINE, Embase, Web of Science, Scopus, Cochrane Central Register of Controlled Trials, China Academic Journals Full-text Database (CNKI), China Online Journals (WANFANG Data), Weipu Database, Traditional Chinese Medicine Database System, and Airiti Library (from 1950 to June 2024).

The search strategy was constructed using a combination of MeSH subject headings and keywords related to CHDs to manage upper digestive tract cancers (Supplementary 1). Here, the term "Chinese herbal drugs" refers to TCM formulas, single herbs, phytocompounds, and combinations of phytocompounds.

Eligibility criteria

Clinical studies: randomized controlled clinical trials involving patients with lip and oral cavity, salivary gland, hypopharyngeal, oropharyngeal, laryngeal, esophageal, gastroesophageal junction, or gastric cancer; the number of patients in each group was greater than 30; herbal drug compositions were clearly described, and not modified during the clinical trial period.

Preclinical studies: pharmacological studies involving rodent animal model(s) of an upper digestive tract cancer,

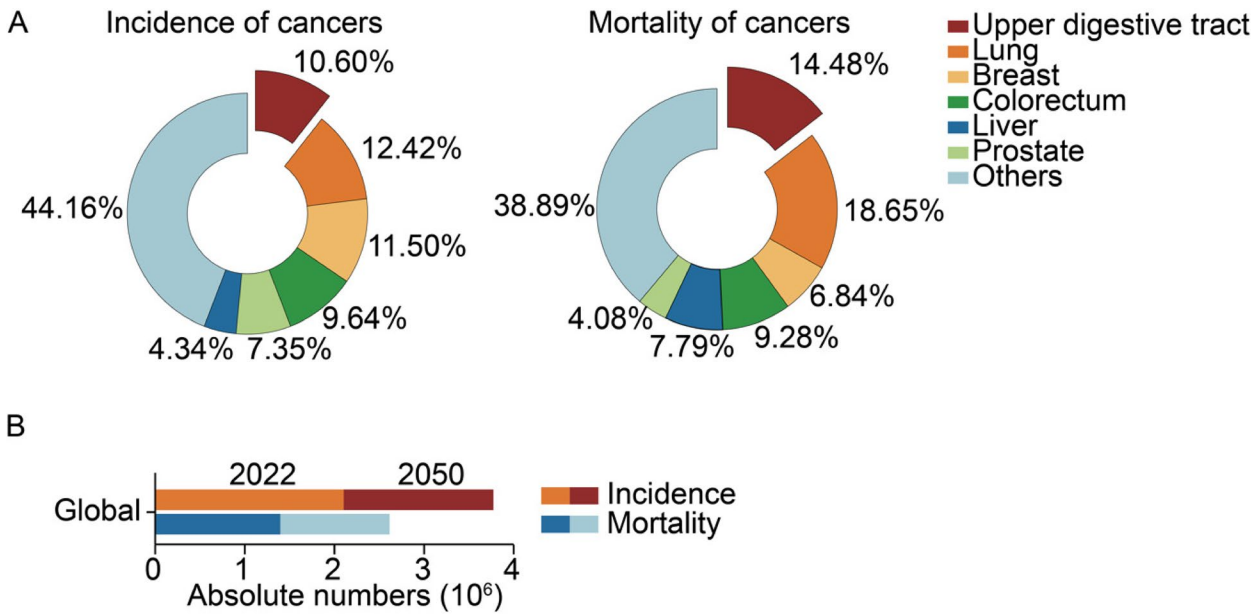

Fig. 1 Global cancer statistics. **A** Pie chart showing the percentage of cases and deaths with respect to each tumor type in 2022, globally. Data shown in the panel was obtained from *GLOBOCAN* 2022 [3]. **B** Bar chart depicting the number of cases and deaths of upper digestive tract cancers in 2022 and 2050, globally. Data shown in the panel was obtained from the Global Cancer Observatory: Cancer Tomorrow (version 1.1) [4]

involving CHDs that have undergone clinical studies for the evaluation of their anticancer efficacy and were used in the same form as in the clinical studies, using multiple doses, and having positive control(s); chemical analyses involving CHDs that have undergone clinical efficacy evaluations for managing precancerous lesions and/or cancer in the upper digestive tract.

Results

Description of reviewed studies

We identified 181 eligible randomized controlled clinical studies (Fig. 2). Tables 1 & 2 summarize the details of the reviewed studies. The eligible clinical trials studied 3 types of cancer (laryngeal cancer, esophageal cancer, and gastric cancer) and 3 types of precancerous lesions (oral leukoplakia, esophageal epithelial hyperplasia, and gastric precancerous lesions). In cancer treatment, 126 CHDs were used as adjuvant to conventional therapies (Table 1). Table 1 is divided into four sub-tables based on the type of conventional therapies: radiotherapy, chemotherapy, chemoradiotherapy, and targeted therapy. For the management of precancerous lesions, six CHDs were used alone, while six others were used in combination with conventional therapies (Table 2).

No preclinical pharmacological or chemical studies were eligible.

Table 3 summarizes the compositions of the reviewed CHDs.

We introduce the clinical study results of CHDs listed in Table 1 & 2 under five subtitles.

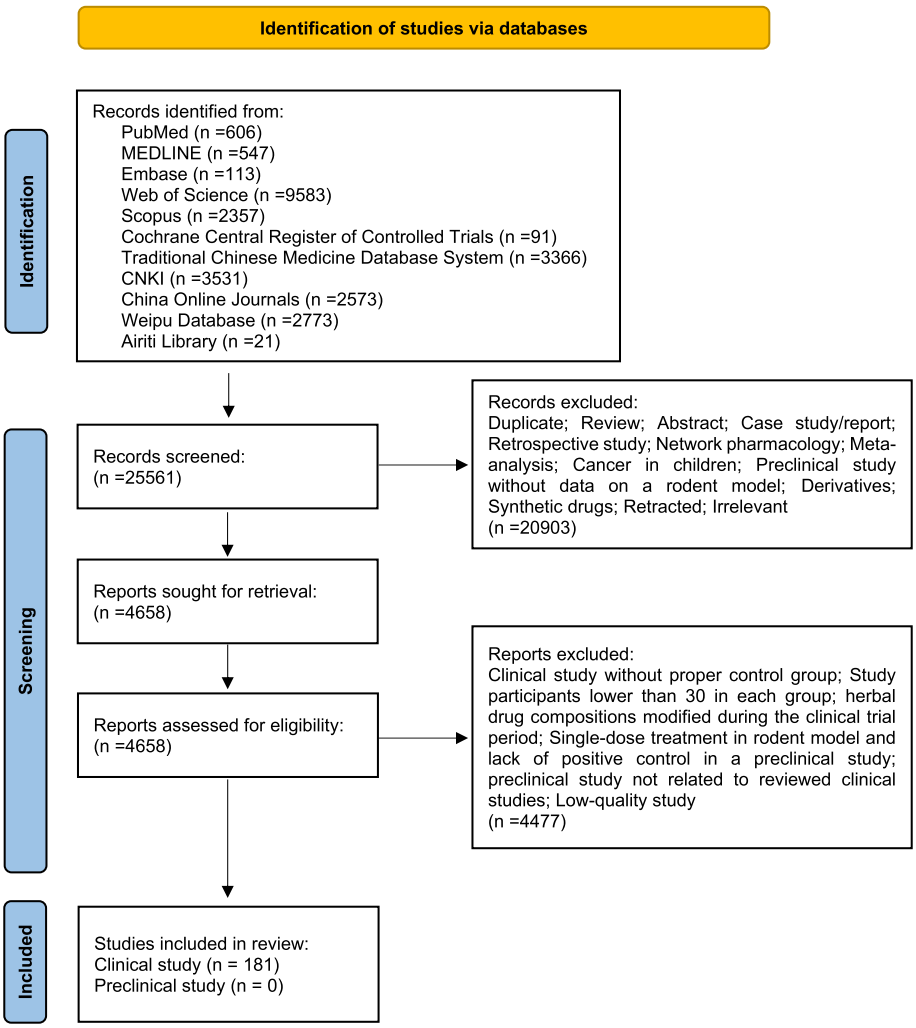

Fig. 2 Flow diagram of the screening process. In total, 181 clinical studies were selected for review. Low-quality study: a study in which the results do not support the authors' claims, or a study that lacks a clear description of the herbal drug composition

Table 1 Chinese herbal drugs used in combination with conventional therapies

Table 1.1

Chinese herbal drugs used in combination with radiotherapy

Conventional treatment plan	Cancer type (Stage/TNM), Participant number (treatment/control)	Chinese herbal drug	Effect[1]	Ref.
Radiotherapy	EC (76/72, 30/30)	Bruceae Fructus Oil Injection	1-year and 2-year overall survival; Objective response rate↑; Adverse effects↓; Quality of life↑; Circulating T-cells: $CD4^+$↑, $CD4^+$/ $CD8^+$↑;	[14, 15]
Radiotherapy	EC (40/40)	Bruceae Fructus Oil Oral Liquid	Objective response rate↑; Adverse effects↓; Quality of life↑; Rates of higher-grade radiation esophagitis↓;	[16]
Radiotherapy	EC (53/53)	Pingxiao Tablet	1-year, 3-year, and 5-year overall survival↑;	[17]
Radiotherapy	EC (46/46)	Huisheng Koufuye	1-year overall survival↑, Median overall survival (16.4/9.6 months);	[18]
Radiotherapy	EC (65/65, 32/30)	Irisquinone Capsule	1-year and 3-year overall survival↑; Objective response rate↑;	[19, 20]
Radiotherapy	EC (42/42)	Fuzheng Kangai Jiedu Formula	2-year overall survival↑, Longer progression-free survival↑ (12/8 months); Quality of life↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓; Serum tumor marker: CA19-9↓, CYFRA21-1↓;	[21]
Radiotherapy	EC (116/116)	Fuzheng Guben Granule	1-year, 3-year, and 5-year overall survival↑; WBC↑, RBC↑, PLT↑; Rates of higher-grade radiation esophagitis↓;	[22]
Radiotherapy	EC (43/43)	Aiyishu Injection	Disease control rate↑;	[23]
Radiotherapy	EC (40/40, 30/30)	Elemene Injection	Objective response rate↑; Quality of life↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑; WBC↑, lymphocyte count↑; Serum tumor marker: CEA↓, CA19-9↓;	[24, 25]
Radiotherapy	EC (63/63)	Fufang Danshen Injection	Objective response rate↑; WBC↑; Rates of higher-grade radiation esophagitis↓;	[26]
Radiotherapy	EC (30/30)	Fufang Kushen Injection	Adverse effects↓; Quality of life↑;	[27]
Radiotherapy	EC (30/33)	Fuzheng Yiliu Granule	RBC-C3bRR↑, RBC-ICRR↑; CD44v6↓;	[28]

Table 1 (continued)

Radiotherapy	EC (38/38)	Huachansu Capsule	Objective response rate↑; Adverse effects↓;	[29]
Radiotherapy	EC (III) (48/48, age >75)	Kanglaite Injection	Overall survival↑ (NS), Objective response rate↑ (NS); Adverse effects↓;	[30]
Radiotherapy	EC (30/30)	Modified Liuwei Dihuang Decoction	Adverse effects↓;	[31]
Radiotherapy	EC (49/49)	Shenqi Liuwei Dihuang Decoction	Objective response rate↑; Adverse effects↓;	[32]
Radiotherapy	EC (40/40)	Si Jun Zi Tang	Objective response rate↑;	[33]
Radiotherapy	EC(III, IV) (62/58)	Xiangsha Bazhen Decoction	Disease control rate↑ (NS); Circulating T-cells: $CD4^+$↑, $CD8^+$↓, $CD4^+/CD8^+$↑; Tumor tissue NFκB p50↓, tumor tissue NFκB p65↓; Adverse effects↓;	[34]
Radiotherapy	EC (50/48)	Sishen Jiedu Decoction	Objective response rate↑; Adverse effects↓; Quality of life↑;	[35]
Radiotherapy	EC (30/30)	Sishen Jiedu Decoction	Objective response rate↑; Adverse effects↓; Quality of life↑;	[36]
Radiotherapy	EC (44/43)	Xuefu Zhuyu Decoction	WBC↑, RBC↑, PLT↑;	[37]
Radiotherapy	EC (II, III) (50/50)	Yangzheng Xiaoji Capsule	Quality of life↑;	[38]
Radiotherapy	ESCC (32/32)	Antike Capsule	Objective response rate↑; Adverse effects↓;	[39]
Radiotherapy	ESCC (33/32)	Liushen Pill	Objective response rate↑; Serum cytokine level: CRP↓, TNF-α↓, IL 1β↓; Serum tumor marker: VEGF↓, MVD↓;	[40]
Radiotherapy	ESCC (I-III) (30/30)	Astragalus Polysaccharide Injection	Objective response rate↑; Quality of life↑;	[41]
Radiotherapy	ESCC (Advanced) (40/40)	Lianqi Capsule	Circulating T-cells: $CD4^+$↑, $CD8^+$↓, $CD4^+/CD8^+$↑; Serum tumor marker: CEA↓, SCC-Ag↓, CYFRA21-1↓;	[42]

Table 1 (continued)

Radiotherapy	GC (III, IV) (47/47)	Modified Fuzheng Guben Quxie Decoction	1-year overall survival↑, Longer progression-free survival (7.09±1.37/5.59±1.12), Median overall survival (12.45±2.26/9.91±2.08); Objective response rate↑, disease control rate↑; Serum tumor marker: CEA↓, CA19-9↓, CCL20↓; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD4^+/CD8^+$↑;	[43]
Radiotherapy	GC (41/40)	Yangzheng Sanjie Decoction	Disease control rate↑; Serum tumor marker: CEA↓, VEGF↓, CD44V6↓; Adverse effects↓;	[44]

CA19-9 Carbohydrate antigen 19-9, *CA125* Cancer antigen 125, *CEA* Carcinoembryonic antigen, *CYFRA21-1* Cytokeratin 19 fragment, *EC* Esophageal cancer, *ESCC* Esophageal squamous cell carcinoma, *GC* Gastric cancer, *MVD* Micro-vessel density, *RBC* Red blood cell count, *RBC-C3bRR* Red cell C3b receptor, *RBC-ICRR* Red blood cell immune complex rosette rate, *WBC* White blood cell count, *PLT* Platelet count, *VEGF* Vascular endothelial growth factor;
Quality of life refers to score of Karnofsky performance status or QLQ-C30;
Adverse effects including to but not limited to anemia, leukocytosis, abdominal pain, nausea, vomiting, platelet count decreased, and white blood cell decreased.
[1]only $p<0.05$ vs. control group after treatment; NS, no statistical difference vs. control group after treatment.

Table 1.2

Chinese herbal drugs used in combination with chemotherapies

Conventional treatment plan	Cancer type (Stage/TNM), Participant number (treatment/control)	Chinese herbal drug	Effect[1]	Ref.
Fluoropyrimidine-based chemotherapeutics				
S-1	GC (IV) (30/30)	Bo-Er-Ning Capsule	Objective response rate↑; Adverse effects↓; Quality of life↑;	[45]
Capecitabine	GC (60/60)	Yangzheng Xiaoji Capsule	Serum tumor markers: CEA↓; Circulating T-cells: $CD4^+$↑, $CD4^+CD25^+$Treg↓; Adverse effects↓; Quality of life↑;	[46]
S-1	GC (41/41)	Shenyi Jianzhong Decoction	Objective response rate↑, Disease control rate↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+/CD8^+$↑; Adverse effects↓; Quality of life↑;	[47]
S-1	GC (32/32)	Shenyi Jianzhong Decoction	Disease control rate↑; Circulating T-cells: $CD4^+$↑, $CD4^+/CD8^+$↑; Adverse effects↓; Quality of life↑;	[48]

Table 1 (continued)

Capecitabine	GC (IV) (64/65)	Fuzheng Jiedu Quyu Method-based Formula	Median progression-free survival↑ (6.3/5 months); Objective response rate↑, Adverse effects↓; Quality of life↑;	[49]
5-FU (postoperative)	GC (60 to75-year old patients) (49/49)	Xiaoai Decoction	1-year and 2-year overall survival↑; Survival time↑ (20.98±2.38/18.71±1.92 months); Progression-free survival↑ (18.41±1.62/16.51±1.43 months); Disease control rate↑; Circulating T-cells: $CD3^{+}$↑, $CD4^{+}$↑; Immunoglobulins in blood: IgG↑, IgA↑, IgM↑;	[50]
5-FU	GC (96/92)	Buyang Huanwu Tang	1-year, 3-year, 4-year, and 5-year survival rate↑	[51]
S-1	GC (30/30)	Fufang Hongdoushan Capsule	Objective response rate↑;	[52]
S-1	GC (50/50)	Shenqi Jianwei Decoction	Objective response rate↑; Quality of life↑; Circulating T-cell activity: $CD4^{+}CD25^{+}$Treg↑, $CD4^{+}CD25^{-}$Treg↑; Serum tumor markers: MMP-2↓, MMP-9↓;	[53]
S-1	GC (45/45)	Jiawei Lizhong Decoction	Disease control rate↑; Adverse effects↓;	[54]
S-1 (postoperative)	GC (II, III) (55/55)	Hochu-ekki-to	Lower 3-year progression-free survival (NS); Positive effects in reducing toxicity (NS); Higher completion rate in elderly patients (NS);	[55]
Tegafur	GC (30/30)	Jianpi Huazheng Decoction	Quality of life↑;	[56]
CF regimen				
CF regimen	EC (II, III) (42/42)	Sishen Jiedu Decoction	1-year, 3-year, and 5-year overall survival↑; Objective response rate↑; Adverse effects↓; Quality of life↑; Immunoglobulins in blood: IgA↓, IgM↓, IgG↓;	[57]

Table 1 (continued)

CF regimen	ESCC (II-IV) (40/40)	Tongguanteng Oral Solution	Objective response rate↑; Adverse effects↓; Circulating T-, NK-, and NKT cell: $CD4^+$↑, $CD4^+$/ $CD8^+$↑, NK cell↑, NKT cell↑;	[58]
CF regimen	EC (III, IV) (43/43)	Xiaoaiping Tablet	Circulating T-cells: $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑; Serum tumor markers: CEA↓, CA125↓, CA19-9↓, VEGF↓,TGF β1↓, MMP-9↓, NGAL↓;	[59]
CF regimen	EC (32/32)	Fuzheng Guben Decoction	Objective response rate↑ (NS); Adverse effects↓;	[60]
CF regimen	EC (III, IV) (30/30)	Xuanfu Daizhe Tang	Objective response rate↑ (NS); Quality of life↑;	[61]
CF regimen	EC (30/30)	Ye Ge Yin No.2	Objective response rate↑ (NS); Adverse effects↓;	[62]
CF regimen	GC (IV) (55/54)	Bo-Er-Ning Capsule	3-year overall survival↑; Adverse effects↓; Quality of life↑;	[63]
Taxanes plus platinum-based regimen				
PC regimen	EC (36/36)	Shidao Tongjie Formula	3-year overall survival↑ Circulating T-cells: $CD3^+$↑, $CD4^+$/ $CD8^+$↑, NK↑;	[64]
TP regimen	EC (IIB-IIIC) (51/55, 40/40)	Shidao Tongjie Granule	Median disease-free survival↑ (34.6/23.2 months); Objective response rate↑; Adverse effects↓; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑, NK↑;	[65, 66]
TP regimen	EC (30/30)	Esophageal Pingsan	Adverse effects↓; Quality of life↑;	[67]
TP regimen	EC (IV) (60/60)	Lianqi Capsule	Objective response rate↑, disease control rate↑; Quality of life↑; Circulating T-cells: $CD3^+$↓, $CD4^+$↓, $CD8^+$↑, $CD4^+$/ $CD8^+$↓; Serum tumor markers: CEA↓, SCC-Ag↓, CYFRA21-1↓;	[68]

Table 1 (continued)

PC regimen	EC (44/44)	Yunzhitangtai Capsule	Objective response rate↑, disease control rate↑; Quality of life↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+/CD8^+$↑; Serum tumor marker: CEA↓, sMICA↓, CYFRA21-1↓; YY1↓, SCC-Ag↓, CD44v↓, VEGF↓, MMP-9↓, OPN↓;	[69]
Docetaxel + nedaplatin	EC (III, IV) (52/51)	Yunzhitangtai Capsule	Objective response rate↑, disease control rate↑; Circulating T-cells: $CD3^+$↓, $CD4^+$↓, $CD8^+$↑, $CD4^+/CD8^+$↓; Immunoglobulins in blood: IgA↑, IgM↑, IgG↑; Serum tumor markers: CEA↓, SCC-Ag↓, CA19-9↓;	[70]
Docetaxel + nedaplatin	EC (III, IV) (32/32)	Tongguanteng Oral Liquid	Objective response rate↑; Adverse effects↓; Quality of life↑; Circulating T-, NK-, and NKT cell: $CD4^+$↑, $CD4^+/CD8^+$↑, NK cell↑, NKT cell↑;	[71]
Cisplatin + docetaxel	GC (IV) (40/40)	Jianpi Wenzhong Tang	Objective response rate↑; Adverse effects↓; Quality of life↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD4^+/CD8^+$↑; NK↑;	[72]
Cisplatin + docetaxel	EC (30/30)	Tongye Tang	WBC↑, RBC↑, PLT↑; Quality of life↑;	[73]
Cisplatin + docetaxel	EC (IV) (47/47)	Liu Jun Zi Tang	Objective response rate↑, disease control rate↑; Adverse effects↓; Immunoglobulins in blood: IgA↑, IgM↑, IgG↑; Serum tumor markers: TGF-β1RI↓, TGF-β1RII↓, Smad4↓, Smad7↑;	[74]
TP regimen	GC (35/35)	Shenzhu Jiedu Tang	Circulating T-cells: $CD3^+$↑, $CD4^+/CD8^+$↑; Adverse effects↓; Quality of life↑;	[75]
TP regimen	EC (IIIB-IV) (43/40)	Jianpi Tongluo Decoction	Objective response rate↑; Quality of life↑; Circulating T-cells: $CD4^+$↑, $CD8^+$↓, $CD4^+/CD8^+$↑;	[76]

Table 1 (continued)

DCF regimen				
DCF regimen	GC (48/49)	Bruceae Fructus Oil Oral Liquid	Objective response rate↑ (NS), Disease control rate↑ (NS); Adverse effects↓; Quality of life↑;	[77]
DCF regimen	GC (32/32)	Shenhu Banxia Decoction	Objective response rate↑; Quality of life↑; Serum Vimentin↓;	[78]
DCF regimen	GC (III, IV) (33/33)	Xiangsha Liujunzi Tang	1-year, 2-year, and 3-year overall survival↑; Adverse effects↓; Quality of life↑;	[79]
DCF regimen	GC (32/33)	Matrine Injection	Adverse effects↓; Quality of life↑;	[80]
DCF regimen	LSCC (Locally advanced) (39/39, 36/36)	Pingxiao Tablet	Objective response rate↑, disease control rate↑; Quality of life↑; Circulating T-cells: $CD3^{+}$↑, $CD4^{+}$↑, $CD4^{+}$/ $CD8^{+}$↑; Serum tumor marker: CA19-9↓, CA72-4↓, SCC-Ag↓, CYFRA21-1↓, sTNFRI↓, VEGF↓, MMP-9↓, β_2-MG↓;	[81, 82]
DOF regimen (postoperative)	GC (48/48)	Fuzi Lizhong Tang	Adverse effects↓; Circulating T-cells: $CD8^{+}$↓, $CD4^{+}$/ $CD8^{+}$↑;	[83]
5-FU + paclitaxel + oxaliplatin	GC (43/43)	Yunnan Provincial Hospital of Traditional Chinese Medicine-prepared Decoction	Adverse effects↓; Quality of life↑;	[84]
TEX regimen	GC (30/30)	Kanglaite Injection	Objective response rate↑; Quality of life↑;	[85]
FOLFOX regimen				
FOLFOX regimen	GC (64/64)	Cidan Capsule	Median overall survival (9.2/8); Objective response rate↑; Adverse effects↓;	[86]
FOLFOX regimen (postoperative)	GC (II, III) (30/30)	Jianpi Hewei Ke'ai Tang	2-year & 3-year progression-free survival↑; Adverse effects↓; Quality of life↑;	[87]
FOLFOX regimen (postoperative)	GC (II, III) (32/32)	Jianwei Sanjie Prescription	Longer progression-free survival↑ (76.47±6.542/44.597±8.307 months); Adverse effects↓; Quality of life↑; Serum tumor marker: CA19-9↓, CA72-4↓, CEA↓;	[88]

Table 1 (continued)

FOLFOX regimen	GC (30/32)	Shengxue Tang	3-year overall survival↑; Objective response rate↑; Adverse effects↓;	[89]
FOLFOX regimen	GC (II-IV) (36/30)	Huazhuo Hewei Sanjie Tang	1-year overall survival↑; Disease control rate↑; Adverse effects↓;	[90]
FOLFOX regimen	GC (Advanced) (52/49)	Wenyang Huazheng Tang	2-year, 3-year, and 4-year overall survival↑; Adverse effects↓;	[91]
FOLFOX regimen (postoperative)	GC (40/40)	Xinye County Hospital of Traditional Chinese Medicine-prepared Decoction	2-year overall survival↑; Adverse effects↓;	[92]
FOLFOX regimen	GC (65/65)	Huangqi Injection + Danshen Injection	3-year overall survival↑; Objective response rate↑; Adverse effects↓; Tumor size↓, Case number of muscular layer invasion↓; Serum tumor marker: VEGF↓, CEA↓;	[93]
FOLFOX regimen	GC (63/63)	Xiangsha Liujunzi Tang	Objective response rate↑; Adverse effects↓; Quality of life↑;	[94]
FOLFOX regimen	GC (30/30)	Jianpi Huayu Tang	Objective response rate↑; Adverse effects↓; Quality of life↑;	[95]
FOLFOX4 regimen	GC (47/47)	Buxu Jiedu Tang	Objective response rate↑; Adverse effects↓; Quality of life↑;	[96]
FOLFOX4 regimen (postoperative)	GC (II-IV) (84/84)	Jianpi Yangwei Tang	Objective response rate↑; Adverse effects↓;	[97]
FOLFOX4 regimen	GC (48/48)	Mianyang Hospital of Traditional Chinese Medicine-prepared Jianpi Huayu Tang	Objective response rate↑; Quality of life↑; Adverse effects↓; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↑;	[98]
FOLFOX regimen	GC (90/90, 45/45)	Fuzheng Xiaozheng Tang	Objective response rate↑; Quality of life↑;	[99, 100]
FOLFOX4 regimen	GC (52/52)	Modified Xuezheng Decoction	Objective response rate↑;	[101]
FOLFOX regimen	GC (34/34)	Elemene Injection	Adverse effects↓; Quality of life↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD4^+$/ $CD8^+$↑;	[102]

Table 1 (continued)

FOLFOX4 regimen	GC (60/60)	Huayu Jianpi Tang	Quality of life↑; Serum tumor marker: CEA↓, CA19-9↓, CA125↓; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↑;	[103]
FOLFOX4 regimen	GC (34/34)	Shiyiwei Shenqi Tang	Objective response rate↑; Complement tests: C3↑; Circulating T-cells: $CD4^+$/ $CD8^+$↑; Immunoglobulins in blood: IgM↓, IgG↓;	[104]
FOLFOX4 regimen (postoperative)	GC (III, IV) (56/56)	Modified Shenling Baizhu Tang	Adverse effects↓; Quality of life↑; Circulating T-cells: Th17↓, Treg↓, Th17/Treg↓; Intestinal barrier serum markers: Diamine oxidase↓, D-lactate↓, endotoxin↓; Fecal microbiota: Coccus to Bacillus ratio↓	[105]
FOLFOX4 regimen	GC (IV) (40/40)	Fuzheng Jianpi Tang + Jianpi Hewei Tang	Adverse effects↓; Quality of life↑;	[106]
FOLFOX4 regimen	GC (120/120)	Jianpi Bushen Yiqi Yangxue Prescription	Quality of life↑;	[107]
FOLFOX4 regimen	GC (50/50)	Liujunzi Plus Tengligen Tang	Adverse effects↓; Quality of life↑;	[108]
FOLFOX4 regimen	GC (33/33)	Qingdao Tumor Hospital-prepared Decoction	Quality of life↑;	[109]
FOLFOX6 regimen	GC (30/30)	Weifu Tang	Quality of life↑; Adverse effects↓;	[110]
FOLFOX regimen	GC (IV) (30/30)	Zibo Hospital of Traditional Chinese Medicine-prepared Prescription	Quality of life↑; Adverse effects↓; Serum tumor marker: CEA↓, CA19-9↓, PGI↓;	[111]
SOX regimen				
SOX regimen	GC (71/71, 34/35)	Huosu Yangwei Oral Liquid	Median overall survival↑ (8.8/7.4 months); Objective response rate↑, disease control rate↑; Adverse effects↓; Quality of life↑;	[112, 113]
SOX regimen	GC (32/30)	Putuo Hospital Affiliated to Shanghai University of Traditional Chinese Medicine-prepared Jianpi Jiedu Tang	1-year overall survival↑; Quality of life↑; Adverse effects↓; Circulating T-cells: NK↑;	[114]

Table 1 (continued)

SOX regimen	GC (30/30, 32/32)	Aidi Injection	Objective response rate↑, Disease control rate↑; Adverse effects↓; Serum tumor marker: CEA↓, CA125↓, CA242↓, CA19-9↓, CA72-4↓;	[115, 116]
SOX regimen	GC (III, IV) (134/134)	Kuerle Hospital-prepared Decoction	Objective response rate↑, disease control rate↑; Circulating T-cells: Th17↓, Treg↓, Th17/Treg↓; Adverse effects↓; Serum tumor marker: CEA↓, CA19-9↓, CA125↓, CA242↓, VEGF↓;	[117]
SOX regimen	GC (54/54)	Buzhong Xiaowei Decoction	Disease control rate↑; Quality of life↑;	[118]
SOX regimen	GC (III) (40/39)	Chanpi Ezhu Tang	Disease control rate↑; Adverse effects↓; Serum tumor marker: CA19-9↓; Immunoglobulins blood test: IgA↓, IgM↓, IgG↓;	[119]
SOX regimen	GC (III, IV) (45/45)	Guangshan County People's Hospital-prepared Shenyi Jianzhong Tang	Disease control rate↑; Quality of life↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD4^+$/ $CD8^+$↑;	[120]
SOX regimen	GC (51/51)	Modified Bazhen Tang	Objective response rate↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD4^+$/ $CD8^+$↑; Serum tumor marker: CEA↓, CA19-9↓, IGF-1↓, PECAM-1↓; WBC↑, RBC↑, PLT↑;	[121]
SOX regimen	GC (50/50)	Fuzheng Xiaoliu Tang	Objective response rate↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑;	[122]
SOX regimen	GC (III, IV) (43/43)	The First Affiliated Hospital of China Medical University-prepared Shenyi Jianzhong Tang	Objective response rate↑; Quality of life↑;	[123]
SOX regimen	GC (43/43)	Jiawei Xiaoxianxiong Tang	Objective response rate↑; Adverse effects↓;	[124]
SOX regimen	GC with chemotherapy-induced oral mucositis (30/30)	Zisheng Xiexin Tang	Objective response rate↑;	[125]

Table 1 (continued)

SOX regimen	GC (51/51)	The Second Hospital of Jiaxing-prepared Decoction	Objective response rate↑; Adverse effects↓; Quality of life↑;Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD4^+$/ $CD8^+$↑; Serum tumor markers: VEGF↓, TIMP1↓, MMP-9↓;	[126]
SOX regimen	GC (IIIB, IV) (37/34)	Kanglaite Injection	Adverse effects↓; Quality of life↑; Serum tumor marker: CEA↓, CA19-9↓;	[127]
SOX regimen	GC (39/39)	Gansu Provincial Cancer Hospital-prepared Jianpi Huayu Decoction	Adverse effects↓; Quality of life↑;	[128]
SOX regimen	GC (45/45)	Shanxi Hospital of Traditional Chinese Medicine-prepared Jianpi Quyu Tang	Adverse effects↓; Quality of life↑;	[129]
SOX regimen (postoperative)	GC (I-III) (39/39)	Sanleng Ezhu Decoction	Circulating T-cells: $CD3^+$↑;$CD4^+$↑, $CD8^+$↓; Serum tumor marker: CA125↓, CA72-4↓, CEA↓, VEGF↓;	[130]
XELOX regimen				
XELOX regimen	GC (32/32)	Bruceae Fructus Oil Injection	1-year & 2-year overall survival↑; Objective response rate↑; Adverse effects↓; Quality of life↑;	[131]
XELOX regimen	EC (Advanced) (44/44)	Shenzhu Jianyun Tiaoqi Tang	1-year overall survival↑; Objective response rate↑; Serum tumor marker: VEGF↓,CYFRA21-1↓	[132]
XELOX regimen	GC (49/49)	Yiqi Jiedu Tang	Objective response rate↑, Disease control rate↑; Serum tumor marker: CEA↓, CA19-9↓, CA72-4↓, CA125↓; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑; motilin↑, gastrin↑;	[133]
XELOX regimen (postoperative)	GC (II, III) (30/30)	Fuzheng Huayu Tang	Disease control rate↑; Adverse effects↓; Circulating T-cells: $CD4^+$↑, $CD8^+$↓, $CD4^+/CD8^+$↑;	[134]
XELOX regimen	GC (42/42)	Astragalus Polysaccharide Injection	Objective response rate↑; Adverse effects↓; IFN-γ↑, IL-4↓, IFN-γ/IL-4↑; ALB↑, PA↑, GH↑;	[135]

Table 1 (continued)

XELOX regimen	GC (III, IV) (30/30)	Jianpi Guben Huadu Tang	Objective response rate↑; Adverse effects↓; Quality of life↑; Serum tumor marker: CEA↓, CA19-9↓;	[136]
XELOX regimen	GC (40/40)	Buzhong Yiqi Tang	Objective response rate↑, disease control rate↑; Quality of life↑; Serum tumor marker: CEA↓, CA19-9↓, CA72-4↓, TPS↓; Serum total protein↑, Serum prealbumin↑, Serum albumin↑, Serum transferrin↑;	[137]
XELOX regimen	GC (40/40)	Jianpi Quyu Tang	Objective response rate↑;	[138]
XELOX regimen	GC (I-III) (40/40)	Jianpi Yishen Tang	Objective response rate↑; Quality of life↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓;	[139]
XELOX regimen	EC (III, IV) (34/34)	Huachansu Capsule	Overall survival↑ (NS); Objective response rate↑; Adverse effects↓; Quality of life↑;	[140]
XELOX regimen	GC (30/30)	Qizhu Fuzheng Tang	Serum tumor marker: CEA↓, CA19-9↓, CA72-4↓; Quality of life↑;	[141]
XELOX regimen	GC (48/48)	Shenling Baizhu Tang	Adverse effects↓; Quality of life↑;	[142]
XELOX regimen	GC (35/35)	The Second People's Hospital of Luxian County-prepared Decoction	Quality of life↑;	[143]
XELOX regimen	GC (34/34)	Huangqi Jianzhong Tang	Adverse effects↓;	[144]
XELOX regimen	GC (55/54)	Jianpi Yangxue Tang	Adverse effects↓; Serum tumor marker: CEA↓, CA19-9↓;	[145]
FAM regimen				
FAM regimen	GC (II-IV) (46/44)	Compound Danshen Dripping Pill	Disease control rate↑; Adverse effects↓; Quality of life↑;	[146]
FAM regimen	GC (Advanced) (36/36)	Shenqi Fuzheng Injection	Objective response rate↑; Adverse effects↓	[147]
FAM regimen	GC (90/90)	Weining Granule	The incidence of recurrence and metastasis at 1 year↓; Serum tumor markers: VEGF↓, MMP-9↓;	[148]

Table 1 (continued)

FAM regimen	GC (Advanced) (31/31)	Xiangsha Yangwei Wan	1-year overall survival↑;	[149]
ECF regimen				
ECF regimen	GC (IIIB, IV) (32/32, 40/40)	Fufang Kushen Injection	1-year & 2-year overall survival↑; Objective response rate↑; Adverse effects↓; Quality of life↑;	[150, 151]
Other chemotherapy regimens				
Cisplatin + leucovorin + paclitaxel	EC (Advanced) (34/34)	Xianchan Tablet	Disease control rate↑; Quality of life↑; Circulating T-cells: $CD3^{+}$↑; Immunoglobulins in blood: IgA↑; Serum tumor markers: CEA↓, NSE↓;	[152]
Cisplatin + gemcitabine	EC (IV) (30/30)	Shenyi Capsule	1-year overall survival↑; Objective response rate↑ (NS); Adverse effects↓; Quality of life↑; Serum tumor marker: VEGF↓,	[153]
5-FU + bleomycin + cisplatin	EC (36/34)	Compound Danshen Dripping Pill	Disease control rate↑; Adverse effects↓; Quality of life↑;	[154]
5-FU + hydroxycamptothecin + cisplatin	EC (III, IV) (106/54)	Huohua Kaitong Capsule	1-year, 2-year, and 3-year overall survival↑; Median overall survival (19/9.5 months); Adverse effects↓; Quality of life↑;	[155]
Cisplatin + vinorelbine (postoperative)	GC (I-III)	Fuzi Lizhong Tang	Objective response rate↑; Adverse effects↓; Circulating T-cells: $CD4^{+}Th17$↓, $CD4^{+}CD25^{+}$Treg↑, Th17/Treg↑; Serum tumor markers: Pentraxin-3↓, CYFRA21-1↓, TTF-1↓, HE4↓;	[156]
5-FU + cisplatin + epirubicin + leucovorin	GC (40/40)	Jiangsu Province Hospital of Traditional Chinese Medicine-prepared Jianpi Jiedu Decoction	Objective response rate↑, Disease control rate↑; Adverse effects↓; Circulating T-cells: $CD3^{+}$↑, $CD4^{+}$↑, $CD4^{+}$/ $CD8^{+}$↑, NK↑;	[157]
Paclitaxel	GC (IIIB, IV) (32/30)	Fuzheng Yiai Tang	Objective response rate↑; Adverse effects↓; Quality of life↑;	[158]
S-1 + paclitaxel	GC (50/50)	Guishao Liujun Tang	Objective response rate↑; Quality of life↑;	[159]

Table 1 (continued)

Cisplatin + paclitaxel + leucovorin	GC (84/84)	Modified Xiangsha Liujunzi Decoction	Adverse effects↓; Quality of life↑;	[160]
5-FU + cisplatin + leucovorin (postoperative)	GC (34/34)	Bruceae Fructus Oil Injection	Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑; Immunoglobulins in blood: IgA↑, IgM↑, IgG↑;	[161]
5-FU + cisplatin + leucovorin	GC (IIIB, IV) (48/48)	Fufang Kushen Injection	Disease control rate↑; Adverse effects↓; Quality of life↑;Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑;	[162]
5-FU + etoposide + leucovorin (postoperative)	GAC (45/45)	Shenyang NO.7 people's Hospital-prepared Jianpi Quyu Decoction	Longer survival (25.6±6.3 months/17.3±5.2 months); Quality of life↑;	[163]
5-FU + etoposide + leucovorin	GC (30/30)	Jianpi Quyu Tang	Objective response rate↑;	[164]

5-FU 5-fluorouracil, *C3* Complement component 3, *CA19-9* Carbohydrate antigen 19-9, *CA125* Cancer antigen 125, *CEA* Carcinoembryonic antigen, *CF* Cisplatin + 5-FU, *DCF* Cisplatin + docetaxel + 5-FU, *DOF* Docetaxel + oxaliplatin + 5-FU, *EC* Esophageal cancer, *ECF* Cisplatin + epirubicin +5-FU, *ECX* Cisplatin + epirubicin + capecitabine, *EOX* Epirubicin + oxaliplatin + capecitabine, *ESCC* Esophageal squamous cell carcinoma, *FAM regimen* 5-FU + doxorubicin + mitomycin, *FLOT* 5-FU + leucovorin + oxaliplatin + docetaxel, *FOLFOX* leucovorin + 5-FU + oxaliplatin, *FP regimen* Cisplatin + 5-FU, *FU-LV* 5-FU + leucovorin calcium, *GAC* Gastric adenocarcinoma, *GC* Gastric cancer, *Hb* Haemoglobin, *LSCC* Laryngeal squamous cell carcinoma, *NK cell* Natural killer cell, *NKT cell* Natural killer T cell, *OSCC* Oral squamous cell carcinoma, *PLT* Platelet count, *RBC* Red blood cell count, *S-1* Tegafur + gimeracil + oteracil,*SOX* S-1 + oxaliplatin, *TEX* Docetaxel + capecitabine + oxaliplatin, *TGF-β1* Transforming growth factor-β1, *TGFβ1RI* Transforming growth factor β1 type I receptor, *TP* Cisplatin + paclitaxel, *TTF-1* Thyroid transcription factor-1, *VEGF* Vascular endothelial growth factor, *WBC* White blood cell count, *XELOX* Capecitabine + oxaliplatin;

Quality of life refers to score of Karnofsky performance status or QLQ-C30;

Adverse effects including to but not limited to anemia, leukocytosis, abdominal pain, nausea, vomiting, platelet count decreased, and white blood cell decreased.

[1]only $p<0.05$ vs. control group after treatment; NS, no statistical difference vs. control group after treatment.

Table 1 (continued)

Table 1.3

Chinese herbal drugs used in combination with chemoradiotherapies

Conventional treatment plan	Cancer type (Stage/TNM), Participant number (treatment/control)	Chinese herbal drug	Effect[1]	Ref.
Paclitaxel + radiotherapy	EC (II-IV) (45/45, 30/30)	Bazhen Tang	Objective response rate↑; Adverse effects↓; Quality of life↑; Circulating T-cells: $CD4^+$↑, $CD4^+$/$CD8^+$↑;	[165, 166]
CF regimen + radiotherapy	EC (Advanced) (37/37)	Bazhen Tang	Objective response rate↑; Quality of life↑; Circulating T-cells: $CD4^+$↑, $CD8^+$↓, NK↑;	[167]
CF regimen + radiotherapy	EC (Advanced) (47/47, 44/44)	Shenmai Injection	Objective response rate↑; Adverse effects↓;	[168, 169]
Capecitabine + radiotherapy	ESCC (Advanced) (60/60, age >70)	Shenmai Injection	Disease control rate↑; Adverse effects↓; Quality of life↑;	[170]
CF regimen + radiotherapy	EC (I-III) (37/38)	Shenqi Fuzheng Injection	1-year and 2-year overall survival↑ (NS); Objective response rate↑ (NS); Adverse effects↓;	[171]
CF regimen + radiotherapy	EC (Advanced) (40/40)	Huachansu Capsule	Median overall survival↑ (15/12 months); Objective response rate↑ (NS); Adverse effects↓;	[172]
mFOLFOX6 regimen + radiotherapy	EC (III, IV) who had cisplatin treatment (30/30)	Xiao'aiping Injection	Disease control rate↑ (NS); Adverse effects↓; Quality of life↑;	[173]
Capecitabine + radiotherapy (postoperative)	GC (II, III) (40/40)	Huaier Keli	Quality of life↑; WBC↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑, NK cell↑;	[174]

CF Cisplatin + 5-FU, *EC* Esophageal cancer, *FOLFOX* Leucovorin + 5-FU + oxaliplatin, *GC* Gastric cancer, *NK cell* Natural killer cell, *WBC* White blood cell count;
Quality of life refers to score of Karnofsky performance status or QLQ-C30;
Adverse effects including to but not limited to anemia, leukocytosis, abdominal pain, nausea, vomiting, platelet count decreased, and white blood cell decreased.
[1]only $p<0.05$ vs. control group after treatment; NS, no statistical difference vs. control group after treatment.

Table 1 (continued)

Table 1.4

Chinese herbal drugs used in combination with targeted therapies

Conventional treatment plan	Cancer type (Stage/TNM), Participant number (treatment/control)	Chinese herbal drug	Effect[1]	Ref.
Apatinib	GC (45/45. 45/45)	Kanglaite Injection	1-year overall survival↑; Longer progression-free survival↑ (11.4/6.2 months); Disease control rate↑; Adverse effects↓; Quality of life↑; Serum cytokine level: IL-2↓, TNF-α↓, INF-γ↓;	[175, 176]
Apatinib	GC (III, IV) (30/30)	Huosu Yangwei Oral Liquid	Adverse effects↓; Quality of life↑;	[177]
Apatinib + S-1	GC (III, IV) (71/71)	Buzhong Xiaowei Decoction	Disease control rate↑; Circulating T-cells: $CD3^+$↑, $CD4^+$↑, $CD8^+$↓; Adverse effects↓;	[178]
Apatinib + S-1	GC (IV) (35/35)	Guben Xiaoai Decoction	Disease control rate↑; Adverse effects↓; Quality of life↑; Serum tumor markers: CEA↓, CA125↓, CA19-9↓;	[179]
Apatinib + S-1	GC (35/35)	Yiyang Jianpi Formula	Disease control rate↑; Adverse effects↓; Serum tumor marker: CEA↓, CA125↓;	[180]

CA19-9 Carbohydrate antigen 19-9, *CA125* Cancer antigen 125, *CEA* Carcinoembryonic antigen, *GC* Gastric cancer, *S-1* tegafur + gimeracil + oteracil;
Quality of life refers to score of Karnofsky performance status or QLQ-C30;
Adverse effects including to but not limited to anemia, leukocytosis, abdominal pain, nausea, vomiting, platelet count decreased, and white blood cell decreased.
[1] only $p<0.05$ vs. control group after treatment; NS, no statistical difference vs. control group after treatment.

Table 2 Chinese herbal drugs in clinical studies for managing precancerous lesions

Conventional treatment plan	Cancer type/ precancerous condition (Stage/TNM) Patient number (treatment/ control)	Chinese herbal drug	Effect[1]	Ref.
Vitamin A and D/Transfer factor capsules	Oral leukoplakia (48/48)	Jinhua Center Hospital-prepared Prescription	Objective response rate↑; Immunoglobulins blood test: IgA↓, IgM↓, IgG↑;	[181]
Recombinant Human p53 Adenovirus Injection	Laryngeal precancerous lesions (42/42)	Modified Sanjiasan	Objective response rate↑; Serum tumor marker: VEGF↓, β_2-MG↓; Circulating T-cells: $CD4^+$↑, $CD8^+$↓, $CD4^+$/ $CD8^+$↑;	[182]
Placebo	Esophageal epithelial hyperplasia (300/149)	Zengshengping	Reversal rate of dysplasia indicated by endoscopy and histopathology↑	[183]
Retinoid or Placebo	Esophageal epithelial hyperplasia (735/755/757 for 3-year, 479/506/507 for 5-year)	Zengshengping	3-year and 5-year EC incidence↓	[184]
Placebo	Oral leukoplakia (59/53)	Zengshengping	Lesions size↓; AgNOR↓, PCNA↓;	[185]
Amoxicillin/Metronidazole/Omeprazole	Gastric precancerous lesions (32/32)	Astragali Radix	Lower recurrence rate within 6 months; Disease control rate↑;	[186]
Vitacoenzyme	Gastric precancerous lesions (49/48)	Echan Jianwei Formula	Disease control rate↑;	[187]
Vitacoenzyme	Gastric precancerous lesions (40/40/40)	Fuwei Kangyi Formula	Synergistic effect with vitacoenzyme: P16↑, Bcl-2↓, COX-2↓, Survivin↓;	[188]
Sodium Rabeprazole Enteric-coated Tablets	Gastric precancerous lesions (32/32)	Huatan Xiaoyu Formula	Objective response rate↑; Serum gastrin↑, serum motilin↑; Serum tumor marker: CEA↓, CA19-9↓, CA72-4↓, CA125↓;	[189]
Vitacoenzyme/bismuth quadruple therapy	Gastric precancerous lesions (31/31)	Huatan Xiaoyu Granule	Objective response rate↑; Gastric juice miR-133a↑, miR-421↓	[190]
Vitacoenzyme	Gastric precancerous lesions (30/30)	Weifuchun Tablet	Objective response rate↑;	[191]
Celecoxib	Gastric precancerous lesions (40/40)	Jiawei Huangqi Jianzhong Formula	Objective response rate↑; IL-10↑, IL-17A↑, IFN-γ↑	[192]
Folic acid	Gastric precancerous lesions (168/168)	Moluodan	Superior to folic acid in reversing dysplasia. No drug-related serious adverse events were observed.	[193]
Omeprazole Enteric-coated Tablets	Gastric precancerous lesions (56/56)	Weiyanfu Formula	Objective response rate↑;	[194]

Bcl-2 B-cell lymphoma 2, *CA19-9* Carbohydrate antigen 19-9, *CA125* Cancer antigen 125, *CEA* Carcinoembryonic antigen, *VEGF* Vascular endothelial growth factor;
[1] only $p<0.05$ vs. control group after treatment.

Results of reviewed studies

In patients receiving radiotherapy

Thirty-one eligible reports studied 27 CHDs in patients receiving radiotherapy. Twenty-one CHDs were tested in esophageal cancer patients, four were tested in esophageal squamous cell carcinoma (ESCC) patients, and two were tested in gastric cancer patients.

Bruceae Fructus Oil Injection, prepared with the oil derived from the fruit of *Brucea javanica*, is a proprietary herbal drug (PHD) approved by the National Medical Products Administration (NMPA) of China for treating cancer. It has been used in the treatment of diverse cancers for several decades [195]. In middle- and late-stage esophageal cancer patients, Bruceae Fructus Oil Injection in combination with radiotherapy significantly increased 1-year survival rate compared to radiotherapy alone (76.3% vs. 56.9%). It was also observed that the combination treatment significantly improved immune

Table 3 Chinese herbal drugs reviewed

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
Multi-herb CHD				
	Aidi Injection	GC	Mylabris, Ginseng Radix et Rhizoma, Astragali Radix, Acanthopanacis Senticosi Radix et Rhizoma Sue Caulis	[115]
	Antike Capsule	ESCC	Angelicae Sinensis Radix, Bufonis Corium	[39]
	Bazhen Tang	EC	Atractylodis Macrocephalae Rhizoma 10g, Jujubae Fructus 2, Codonopsis Radix 20g, Zingiberis Rhizoma Recens 3, Paeoniae Radix Alba 15g, Angelicae Sinensis Radix 12g, Chuanxiong Rhizoma 10g Rehmanniae Radix Preparata 15g, Poria 10g, Glycyrrhizae Radix et Rhizoma 6g	[165–167]
	Buzhong Yiqi Tang	GC	Astragali Radix 15g, Ginseng Radix et Rhizoma 15g, Glycyrrhizae Radix et Rhizoma 15g, Bupleuri Radix 12g, Atractylodis Macrocephalae Rhizoma 10g, Angelicae Sinensis Radix 10g, Citri Reticulatae Pericarpium 6g, Cimicifugae Rhizoma 6g, Zingiberis Rhizoma Recens 9, Jujubae Fructus 6	[137]
	Modified Bazhen Tang	GC	Astragali Radix Praeparata Cum Melle 20g, Codonopsis Radix 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 12g, Poria 15g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g, Rehmanniae Radix Preparata 12g, Chuanxiong Rhizoma Praeparatum Cum Vino Frumenti 9g, Angelicae Sinensis Radix 12g, Paeoniae Radix Alba Tostus 12g, Spatholobi Caulis 30g, Ligustri Lucidi Fructus 12g, Lycii Fructus 12g, Citri Reticulatae Pericarpium 9g, Dioscoreae Rhizoma Tostus Cum Furfure 15g, Rehmanniae Radix Recens 10g	[121]
	Bo-Er-Ning Capsule	GC	Astragali Radix Praeparata Cum Melle, Ligustri Lucidi Fructus Praeparatus Cum Vino Frumenti, Portulacae Herba, Tulipae Bulbus, Paridis Rhizoma, Solani Nigri Herba, Perillae Fructus Tostus, Bombyx Batryticatus Tostus, Rhei Radix et Rhizoma, Borneolum Syntheticum, Galli Gigerii Endothelium Coreneum Tostum	[45, 63]
	Buxu Jiedu Tang	GC	Codonopsis Radix, Astragali Radix, Pinelliae Rhizoma, Poria, Bambusae Caulis in Taenias, Corydalis Rhizoma, Massa Medicata Fermentata, Crataegi Fructus, Coicis Semen, Scutellariae Barbatae Herba, Curcumae Longae Rhizoma	[96]
	Buyang Huanwu Tang	GC	Astragali Radix 100g, Paeoniae Radix Rubra 15g, Angelicae Sinensis Radix 15g, Chuanxiong Rhizoma 15g, Persicae Semen 15g, Fritillariae Thunbergii Bulbus 20g, Scrophulariae Radix 15g, Ostreae Concha Recens 30g, Atractylodis Macrocephalae Rhizoma Praeparatum 15g, Pseudostellariae Radix 30g	[51]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Buzhong Xiaowei Decoction	GC	Hedyotidis Herba 24g, Pseudostellariae Radix 30g, Salviae Miltiorrhizae Radix et Rhizoma 20g, Curcumae Rhizoma 9, Dendrobii Caulis 15g, Glycyrrhizae Radix et Rhizoma 9g, Paeoniae Radix Alba 24g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Angelicae Sinensis Radix 9g, Poria 20g, Ophiopogonis Radix 15g	[118, 178]
	Hochu-ekki-to (TJ-41, Japanese Kampo)	GC	Ginseng Radix et Rhizoma, Atractylodis Macrocephalae Rhizoma, Glycyrrhizae Radix et Rhizoma, Astragali Radix, Angelicae Sinensis Radix, Cimicifugae Rhizoma, Bupleuri Radix, Citri Reticulatae Pericarpium, Zingiberis Rhizoma, Jujubae Fructus	[55]
	Chanpi Ezhu Tang	GC	Bufonis Corium 9g, Curcumae Rhizoma 9g, Strychni Semen Recens 3g, Akebiae Fructus 12g, Ponciri Fructus 30g, Trichosanthis Fructus 30g, Hedyotidis Herba 30g, Solani Lyrati Herba 30g, Arcae Concha Usta 30g, Coicis Semen 30g, Arecae Semen 15g, Paeoniae Radix Rubra 15g, Prunellae Spica 15g, Aucklandiae Radix 9g	[119]
	Compound Danshen Dripping Pill	EC	Salviae Miltiorrhizae Radix et Rhizoma, Notoginseng Radix et Rhizoma, Borneolum Syntheticum	[154]
	Esophageal Pingsan	EC	Ginseng Radix et Rhizoma, Panacis Quinquefolii Radix, Violaceum Halitum, Margarita, Bovis Calculus Artifactus, Pulvis Fellis Ursi, Scorpio, Scolopendra,Asari Radix et Rhizoma, Notoginseng Radix et Rhizoma, Mentholum, Cinnabaris	[67]
	Cidan Capsule	GC	Curcumae Rhizoma, Cremastrae Pseudobulbus, Strychni Semen Pulveratum, Polistis Scrobiculatio, Bruceae Fructus, Bovis Calculus Artifactus, Bombyx Batryticatus, Salviae Miltiorrhizae Radix et Rhizoma, Astragali Radix, Angelicae Sinensis Radix, Borneolum Syntheticum	[86]
	Echan Jianwei Formula	Gastric precancerous lesions	Astragali Radix 30g, Pseudostellariae Radix 30g, Poria 10g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g, Galli Gigerii Endothelium Coreneum 15g, Lilii Bulbus15g, Curcumae Rhizoma 10g, Squama Manis Praeparata 3g, Bombyx Batryticatus 10g, Angelicae Sinensis Radix 10g, Paeoniae Radix Alba 20g, Aurantii Fructus 10g, Citri Sarcodactylis Fructus 10g	[187]
	Fufang Danshen Injection	EC	Salviae Miltiorrhizae Radix et Rhizoma	[26]
	Fufang Kushen Injection	EC, GC	Sophorae Flavescentis Radix, Heterosmilacis Rhizoma	[27, 150, 151, 162]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Fuzheng Guben Decoction	EC	Panacis Quinquefolii Radix 15g, Astragali Radix Recens 30g, Angelicae Sinensis Radix 15g, Hedyotidis Herba 30g, Scutellariae Barbatae Herba 30g, Spatholobi Caulis 30g, Citri Reticulatae Pericarpium 12g, Pinelliae Rhizoma 15g, Bambusae Caulis in Taenias 12g, Galli Gigerii Endothelium Coreneum 30g, Curcumae Rhizoma 15g, Magnoliae Officinalis Cortex 15g, Paeoniae Radix Alba 20g	[60]
	Fuwei Kangyi Formula	Gastric precancerous lesions	Poria 20g, Hedyotidis Herba 20g, Aurantii Fructus 20g, Codonopsis Radix Tostus 15g, Curcumae Rhizoma 15g, Citri Reticulatae Pericarpium 10g, Pinelliae Rhizoma 10g, Scrophulariae Radix 10g, Acori Tatarinowii Rhizoma 10g, Galli Gigerii Endothelium Coreneum 10g, Coptidis Rhizoma 6g, Glycyrrhizae Radix et Rhizoma 6g	[188]
	Modified Fuzheng Guben Quxie Decoction	GC	Poria 15g, Astragali Radix 30g, Trogopterori Faeces 10g, Ginseng Radix et Rhizoma Rubra 15g, Asini Corii Colla 15g, Dioscoreae Rhizoma 30g, Cervi Cornu Pantotrichum Concisum 15g, Succinum 6g, Angelicae Sinensis Radix 10g, Gynostemmatis Pentaphylli Herba seu Radix 15g, Actinidiae Chinensis Radix 10g, Notoginseng Radix et Rhizoma 6g	[43]
	Fuzheng Kangai Jiedu Formula	EC	Astragali Radix 30g, Isatidis Radix 30g, Codonopsis Radix 30g, Raphani Semen 30g, Rehmanniae Radix Recens 30g, Cremastrae Pseudobulbus 15g, Scutellariae Barbatae Herba 15g, Trichosanthis Fructus 15g, Curcumae Rhizoma 15g, Fritillariae Thunbergii Bulbus 15g, Prunellae Spica 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Furfure 15g, Citri Reticulatae Pericarpium 9g, Belamcandae Rhizoma 9g, Pinelliae Rhizoma Praeparatum Cum Zingibere9g, Arisaematis Rhizoma Praeparatum 9g, Scrophulariae Radix 9g, Scorpio 6g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[21]
	Fuzi Lizhong Tang	GC	Aconiti Lateralis Radix Praeparata Praeparatum 10g, Atractylodis Macrocephalae Rhizoma 10g, Zingiberis Rhizoma Praeparatum 10g, Ginseng Radix et Rhizoma 10g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[83, 156]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Fuzheng Guben Granule	EC	Astragali Radix, Codonopsis Radix, Crataegi Fructus, Citri Reticulatae Pericarpium, Ligustri Lucidi Fructus, Psoraleae Fructus, Atractylodis Macrocephalae Rhizoma, Lycii Fructus, Poria, Massa Medicata Fermentata, Hordei Fructus Germinatus, Spatholobi Caulis, Artemisiae Scopariae Herba, Cuscutae Semen	[22]
	Fuzheng Huayu Tang	GC	Astragali Radix30g, Scutellariae Barbatae Herba 30g, Poria 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Angelicae Sinensis Radix 15g, Paeoniae Radix Alba Dioscoreae Rhizoma 15, Pinelliae Rhizoma Praeparatum Cum Zingibere Trichosanthis Fructus 12g, Panacis Quinquefolii Radix 12g, Carthami Flos 12g, Pheretima 12g, Asini Corii Colla 9g, Bupleuri Radix Glycyrrhizae Radix et Rhizoma 9g, Notoginseng Radix et Rhizoma 6g	[134]
	Fuzheng Jianpi Tang	GC	Codonopsis Radix 15g, Ligustri Lucidi Fructus 15g, Polygoni Multiflori Radix 15g, Dioscoreae Rhizoma 15g, Corni Fructus 15g, Coicis Semen 30g, Astragali Radix 30g, Spatholobi Caulis 30g, Setariae Fructus Germinatus 30g, Hordei Fructus Germinatus 30g, Atractylodis Macrocephalae Rhizoma 10g, Citri Reticulatae Pericarpium 9g, Poria 12g, Glycyrrhizae Radix et Rhizoma 5g	[106]
	Fuzheng Jiedu Quyu Method-based Formula	GC	Astragali Radix, Pseudostellariae Radix, Prunellae Spica, Curcumae Longae Rhizoma, Curcumae Radix, Hedyotidis Herba	[49]
	Fuzheng Xiaoliu Tang	GC	Scutellariae Barbatae Herba 30g, Astragali Radix 20g, Codonopsis Radix 20g, Rehmanniae Radix Recens 20g, Lycii Fructus 20g, Ophiopogonis Radix 20g, Lobeliae Chinensis Herba 10g, Hedyotidis Herba 10g, Polygni Orientalis Fructus 10g, Trionycis Carapax 10g	[122]
	Fuzheng Xiaozheng Tang	GC	Codonopsis Radix 30g, Astragali Radix 30g, Rehmanniae Radix Preparata 30g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Angelicae Sinensis Radix 15g, Pinelliae Rhizoma Praeparatum Cum Zingibere 15g, Poria 12g, Paridis Rhizoma 10g, Hedyotidis Herba 30g, Scrophulariae Radix 15g, Prunellae Spica 15g, Ostreae Concha 30g, Scorpio 10g, Scolopendra 3 or 4, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 20 g (or add Cremastrae Pseudobulbus 12g)	[99, 100]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Fuzheng Yiai Tang	GC	Astragali Radix 30g, Codonopsis Radix 20g, Atractylodis Macrocephalae Rhizoma20g, Coicis Semen 20g, Cuscutae Semen 20g, Mylabris 8g, Manis Squama 15g, Hedyotidis Herba 30g, Cremastrae Pseudobulbus 30g	[158]
	Fuzheng Yiliu Granule	EC	Radix hedysari, radix Radix angelicae sinesis, Rhizoma zekoariae and Radix patriniae at a ratio of 3:1:1:3	[28]
	Guben Xiaoai Decoction	GC	Astragali Radix Praeparata Cum Melle 15g, Haematitum 15g, Taraxaci Herba 15g, Solani Nigri 15g, Herba 15g, Bupleuri Radix 10g, Cinnamomi Ramulus 10g, Ginseng Radix et Rhizoma 10g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure, Massa Medicata Fermentata Fujianensis 10g, Inulae Flos 10g, Salviae Miltiorrhizae Radix et Rhizoma 10g, Magnoliae Officinalis Cortex 10g, Aurantii Fructus Immaturus 10g, Poria 10g, Ganoderma 20g, Hordei Fructus Germinatus Tostus 20g, Ostreae Concha 20g, Setariae Fructus Germinatus Tostus 20g, Pinelliae Rhizoma Praeparatum Cum Zingibere 8g, Persicae Semen 8g, Bletillae Rhizoma 6g, Zingiberis Rhizoma Praeparatum 6g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[179]
	Guishao Liujun Tang	GC	Poria 15g, Codonopsis Radix 15g, Hedyotidis Herba 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Salviae Chinensis Herba 10g, Aucklandiae Radix 10g, Angelicae Sinensis Radix 10g, Pinelliae Rhizoma 10g, Sparganii Rhizoma 10g, Paeoniae Radix Alba 10g, Curcumae Rhizoma 10g, Citri Reticulatae Pericarpium 6g, Amomi Fructus 3g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 3g	[159]
	Jianpi Wenzhong Tang	GC	Codonopsis Radix 20g, Poria 20g, Atractylodis Macrocephalae Rhizoma 15g, Citri Reticulatae Pericarpium 12g, Pinelliae Rhizoma 12g, Aurantii Fructus 10g, Magnoliae Officinalis Cortex 9g, Zingiberis Rhizoma 10g, Amomi Fructus 6g, Zingiberis Rhizoma Recens 15g, Bambusae Caulis in Taenias 15g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[72]
	Huangqi Jianzhong Tang	GC	Astragali Radix 15g, Paeoniae Radix Alba 15g, Cinnamomi Ramulus 10g, Glycyrrhizae Radix et Rhizoma 10g, Zingiberis Rhizoma Recens 10g, Jujubae Fructus 10g	[144]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Huatan Xiaoyu Granule	Gastric precancerous lesions	Pinelliae Rhizoma 10g, Citri Reticulatae Pericarpium 10g, Curcumae Rhizoma 10g, Galli Gigerii Endothelium Coreneum 10g, Poria 15g, Salviae Miltiorrhizae Radix et Rhizoma 15g, Agrimoniae Herba 15g, Hedyotidis Herba 15g, Scutellariae Barbatae Herba 15g, Actinidiae Chinensis Radix 20g, Coicis Semen 30g	[190]
	Huazhuo Hewei Sanjie Tang	GC	Agastaches Herba 15g, Eupatorii Herba 15g, Amomi Fructus 12g, Amomi Fructus Rotundus 15g, Coicis Semen 30g, Coptidis Rhizoma 6g, Pinelliae Rhizoma9g, Ampelopsis Sinicae Caulis 30g, Sophorae Flavescentis Radix 15g, Actinidiae Chinensis Radix 30g, Sargentodexae Caulis 30g, Codonopsis Radix 15g, Atractylodis Macrocephalae Rhizoma 15g, Poria 20g, Astragali Radix 15g	[90]
	Huatan Xiaoyu Formula	Gastric precancerous lesions	Citri Reticulatae Pericarpium 10g, Pinelliae Rhizoma Praeparatum Cum Glycyrrhiza 10g, Galli Gigerii Endothelium Coreneum 10g, Coicis Semen 20g, Typhae Pollen 12g, Scutellariae Barbatae Herba 15g, Agrimoniae Herba 10g, Ranunculi Ternati Radix 10g, Salviae Przewalskii Radix 15g, Taraxaci Herba 10 g	[189]
	Huayu Jianpi Tang	GC	Codonopsis Radix 20g, Astragali Radix 20g, Citri Reticulatae Pericarpium 15g, Atractylodis Macrocephalae Rhizoma 15g, Poria 15g, Dioscoreae Rhizoma 15g, Coicis Semen Recens 15g, Persicae Semen 15g, Carthami Flos 10g, Angelicae Sinensis Radix 15g, Paeoniae Radix Rubra 15g, Hedyotidis Herba 10g, Scutellariae Barbatae Herba 12g, Cremastrae Pseudobulbus 10g, Glycyrrhizae Radix et Rhizoma 8g	[103]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Huisheng Koufuye	EC	Leonuri Herba, Carthami Flos, Zanthoxyli Pericarpium, Hirudo Praeparatum Cum Glycyrrhiza, Angelicae Sinensis Radix, Sappan Lignum, Sparganii Rhizoma Praeparata Cum Aceto, Anemones Raddeanae Rhizoma, Chuanxiong Rhizoma, Dalbergiae Odoriferae Lignum, Cyperi Rhizoma Praeparata Cum Aceto , Ginseng Radix et Rhizoma, Alpiniae Officinarum Rhizoma, Curcumae Longae Rhizoma, Myrrha Praeparata Cum Aceto, Armeniacae Semen Amarum Tostum, Rhei Radix et Rhizoma, Perillae Fructus, Foeniculi Fructus Praeparatus Cum Solutione Salifera, Juglandis Semen, Trogopterori Faeces Acetatum, Trionycis Carapax, Tabanus Seu Arylotus, Caryophylli Flos, Corydalis Rhizoma Praeparata Cum Aceto, Paeoniae Radix Alba, Typhae Pollen Carbonisatum, Olibanum Praeparata Cum Aceto, Toxicodendri Resina Usta, Persicae Semen, Euodiae Fructus, Ferulae Resina, Cinnamomi Cortex, Artemisiae Argyi Folium Praeparata Cum Melle, Rehmanniae Radix Preparata	[18]
	Huohua Kaitong Capsule	EC	Smilacis Chinae Rhizoma, Curcumae Rhizoma, Hirudo, Notoginseng Radix et Rhizoma, Gekko, Clematidis Radix et Rhizoma, Sophorae Tonkinensis Radix et Rhizoma, Cremastrae Pseudobulbus Pleiones Pseudobulbus, Curcumae Radix, Pinelliae Rhizoma, Astragali Radix, Panacis Quinquefolii Radix	[155]
	Huosu Yangwei Oral Liquid	GC	Astragali Radix, Atractylodis Macrocephalae Rhizoma, Codonopsis Radix, Coptidis Rhizoma, Mume Fructus, Jujubae Fructus, Glycyrrhizae Radix et Rhizoma, Zingiberis Rhizoma Recens, Agastaches Caulis, Perillae Caulis, Aurantii Fructus, Citri Sarcodactylis Fructus, Amomi Fructus Rotundus Rehmanniae Radix Recens, Angelicae Sinensis Radix, Chuanxiong Rhizoma, Curcumae Rhizoma, Moutan Cortex, Taraxaci Herba, Trichosanthis Radix, Lycii Fructus, Amomi Fructus	[112, 113, 177]
	Jianpi Bushen Yiqi Yangxue Prescription	GC	Astragali Radix 30g, Polygonati Rhizoma 20g, Atractylodis Macrocephalae Rhizoma 10g, Poria 10g, Glycyrrhizae Radix et Rhizoma 6g, Ligustri Lucidi Fructus 10g, Sanguisorbae Radix 20g, Spatholobi Caulis 30g, Asini Corii Colla 6g, Citri Reticulatae Pericarpium 10g, Pinelliae Rhizoma Praeparatum Cum Alumine 6g, Actinidiae Chinensis Radix 20g	[107]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Jianpi Guben Huadu Tang	GC	Pseudostellariae Radix 30g, Astragali Radix30g, Coicis Semen Recens 30g, Ostreae Concha Recens 30g, Angelicae Sinensis Radix 15g, Solani Lyrati Herba 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 10g, Poria 10g, Polygonati Rhizoma 10g, Dendrobii Caulis 10g, Citri Reticulatae Pericarpium 10g, Aucklandiae Radix 10g, Pinelliae Rhizoma Praeparatum Cum Glycyrrhiza 10g, Solani Nigri Herba 9g, Paridis Rhizoma 9g, Rhodiolae Crenulatae Radix et Rhizoma 9g, Sparganii Rhizoma 5g, Curcumae Rhizoma 5g	[136]
	Jianpi Hewei Tang	GC	Amomi Fructus 5g, Glycyrrhizae Radix et Rhizoma 5g, Citri Sarcodactylis Fructus 9g, Citri Reticulatae Pericarpium 9g, Atractylodis Macrocephalae Rhizoma 10g, Aucklandiae Radix 10g, Poria 12g, Pinelliae Rhizoma 12g, Codonopsis Radix 15g, Coicis Semen 30g	[106]
	Jianpi Hewei Ke'ai Tang	GC	Astragali Radix Recens 25g, Scutellariae Barbatae Herba 25g, Cremastrae Pseudobulbus 25g, Ginseng Radix et Rhizoma 15g, Atractylodis Macrocephalae Rhizoma 15g, Inulae Flos 15g, Pinelliae Rhizoma 15g, Citri Reticulatae Pericarpium 15g, Poria 15g, Haematitum 15g, Arcae Concha 15g, Aurantii Fructus Immaturus 10g, Dendrobii Caulis 10g, Scolopendra 10g, Glycyrrhizae Radix et Rhizoma 10g	[87]
	Jianpi Huayu Tang	GC	Artemisiae Scopariae Herba 30-50g, Polygoni Cuspidati Rhizoma et Radix 20-30g, Cyrtomii Rhizoma 20-30g, Isatidis Radix 20-30g, Scutellariae Barbatae Herba 20-30g, Salviae Miltiorrhizae Radix et Rhizoma 20-30g, Galli Gigerii Endothelium Coreneum 20-30g, Bupleuri Radix 10-15g, Aurantii Fructus 10-15g	[95]
	Gansu Provincial Cancer Hospital-prepared Jianpi Huayu Decoction	GC	Pseudostellariae Radix 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Paridis Rhizoma 15g, Salviae Miltiorrhizae Radix et Rhizoma 15g, Scutellariae Barbatae Herba 15g, Salviae Chinensis Herba 15g, Hedyotidis Herba 10g, Poria 10g, Solani Nigri Herba 10g, Dendrobii Caulis 10g, Dioscoreae Rhizoma 20g	[128]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Mianyang Hospital of Traditional Chinese Medicine-prepared Jianpi Huayu Tang	GC	Galli Gigerii Endothelium Coreneum Recens 5g, Codonopsis Radix 15g, Magnoliae Officinalis Cortex 10g, Atractylodis Macrocephalae Rhizoma 10g, Rhei Radix et Rhizoma 3g, Taraxaci Herba 15g, Crataegi Fructus 15g, Perillae Caulis 10g, Curcumae Rhizoma 10g, Nardostachyos Radix et Rhizoma 10g, Gekko 5g, Trichosanthis Semen 15g, Pinelliae Rhizoma Praeparatum Cum Glycyrrhiza 10g	[98]
	Jianpi Huazheng Decoction	GC	Hedyotidis Herba 30g, Astragali Radix 20g, Fagopyri Dibotrydis Rhizoma 20g, Coicis Semen 20g, Scutellariae Barbatae Herba 20g, Paeoniae Radix Alba 20g, Codonopsis Radix 15g, Actinidiae Chinensis Radix 15g, Atractylodis Macrocephalae Rhizoma 10g, Glycyrrhizae Radix et Rhizoma 10g, Pinelliae Rhizoma 10g, Ligustri Lucidi Fructus 10g, Asparagi Radix 10g, Cyperi Rhizoma 10g, Citri Reticulatae Pericarpium 10g, Salviae Miltiorrhizae Radix et Rhizoma 10g, Curcumae Rhizoma 10g, Salviae Chinensis Herba 10g, Cremastrae Pseudobulbus 10g	[56]
	Jiangsu Province Hospital of Traditional Chinese Medicine-prepared Jianpi Jiedu Decoction	GC	Paeoniae Radix Alba 10g, Codonopsis Radix 10g, Atractylodis Macrocephalae Rhizoma 10g, Coicis Semen 15g, Curcumae Rhizoma 10g, Cinnamomi Ramulus 5g, Salviae Chinensis Herba15g, Impatientis Semen 10g, Scutellariae Barbatae Herba 15g, Hedyotidis Herba 30g, Scorpio 2g, Glycyrrhizae Radix et Rhizoma Recens 5g	[157]
	Putuo Hospital Affiliated to Shanghai University of Traditional Chinese Medicine-prepared Jianpi Jiedu Tang	GC	Astragali Radix Recens 15g, Atractylodis Macrocephalae Rhizoma 12g, Polyporus 15g, Coicis Semen 30g, Akebiae Fructus 15g, Salviae Chinensis Herba 30g, Ampelopsis Sinicae Caulis 30g	[114]
	Jianpi Quyu Tang	GC	Glycyrrhizae Radix et Rhizoma 10g, Solani Lyrati Herba 15g, Salviae Miltiorrhizae Radix et Rhizoma 12g, Codonopsis Radix 12g, Atractylodis Macrocephalae Rhizoma Praeparatum 10g, Citri Reticulatae Pericarpium 10g, Ganoderma 10g, Akebiae Fructus 15g, Dioscoreae Rhizoma 30g, Curcumae Rhizoma10g, Coicis Semen Recens 30g, Hedyotidis Herba 30g, Poria 10g	[138, 164]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Shanxi Hospital of Traditional Chinese Medicine-prepared Jianpi Quyu Tang	GC	Scorpio 6g, Ginseng Radix et Rhizoma 9g, Crataegi Fructus Torrefactionis 10g, Lablab Semen Album 10g, Schisandrae Chinensis Fructus 10g, Galli Gigerii Endothelium Coreneum Praeparata Cum Melle 10g, Citri Reticulatae Pericarpium 10g, Fritillariae Thunbergii Bulbus 15g, Scutellariae Barbatae Herba 15g, Ophiopogonis Radix 30g, Caulis Et Folium Taxi 30g, Hedyotidis Herba 30g, Solani Nigri Herba 30g	[129]
	Shenyang NO.7 people's Hospital-prepared Jianpi Quyu Decoction	GAC	Curcumae Rhizoma 10g, Glycyrrhizae Radix et Rhizoma Recens 10g, Ganoderma10 g, Atractylodis Macrocephalae Rhizoma Praeparatum 10g, Solani Lyrati Herba 15g, Poria 10g, Coicis Semen Recens 30g, Akebiae Fructus 15g, Hedyotidis Herba 30g, Dioscoreae Rhizoma 30g, Salviae Miltiorrhizae Radix et Rhizoma 12g, Astragali Radix 12g	[163]
	Jianpi Tongluo Decoction	EC	Salviae Miltiorrhizae Radix et Rhizoma 20g, Astragali Radix 20g, Prunellae Spica 15g, Amomi Fructus 15g, Curcumae Rhizoma 15g, Aurantii Fructus Immaturus 15g, Paridis Rhizoma 15g, Coptidis Rhizoma 15g, Codonopsis Radix 15g, Sparganii Rhizoma 15g, Pinelliae Rhizoma 6g, Aucklandiae Radix 6g, Citri Reticulatae Pericarpium 6g, Magnoliae Officinalis Cortex 6g, Glycyrrhizae Radix et Rhizoma 6g, Euodiae Fructus 3g	[76]
	Jianpi Yangwei Tang	GC	Astragali Radix 30g, Poria 15g, Atractylodis Macrocephalae Rhizoma 15g, Codonopsis Radix 15g, Dioscoreae Rhizoma 20g, Pinelliae Rhizoma Praeparatum Cum Zingibere 10g, Spatholobi Caulis 15g, Rehmanniae Radix Preparata 15g, Hedyotidis Herba 20g, Glycyrrhizae Radix et Rhizoma 5g	[97]
	Jianpi Yangxue Tang	GC	Pseudostellariae Radix 15g, Rehmanniae Radix Preparata 15g, Pheretima 15g, Lycii Fructus 15g, Poria 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Asparagi Radix 15g, Pinelliae Rhizoma Praeparatum Cum Zingibere 10g, Phellodendri Chinensis Cortex 10g, Sparganii Rhizoma 10g, Amomi Fructus 10g, Curcumae Rhizoma 10g, Glycyrrhizae Radix et Rhizoma 10g, Longan Arillus 6g	[145]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Jianpi Yishen Tang	GC	Hedyotidis Herba 30g, Astragali Radix 30g, Angelicae Sinensis Radix 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Rehmanniae Radix Recens 10g, Lycii Fructus 10g, Codonopsis Radix 10g, Dioscoreae Rhizoma 10g, Saposhnikoviae Radix 15g, Tritici Levis Fructus 30g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[139]
	Jiawei Huangqi Jianzhong Formula	Gastric precancerous lesions	Astragali Radix Praeparata Cum Melle 9g, Paeoniae Radix Alba 36g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 12g, Cinnamomi Ramulus 15g, Zingiberis Rhizoma Recens 15g, Jujubae Fructus 12, Bletillae Ochraceae Rhizoma Pulveratum 3g, Notoginseng Radix et Rhizoma Pulveratum 3g	[192]
	Jiawei Lizhong Decoction	GC	Codonopsis Radix 20-30g, Atractylodis Macrocephalae Rhizoma 10-12g, Zingiberis Rhizoma 3g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 5g, Solani Nigri Herba 8-10g	[54]
	Jianwei Sanjie Prescription	GC	Atractylodis Macrocephalae Rhizoma, Poria, Astragali Radix, Actinidiae Chinensis Radix, Coicis Semen, Curcumae Radix, Hedyotidis Herba, Gekko, Scorpio	[88]
	Jiawei Xiaoxianxiong Tang	GC	Coptidis Rhizoma 3g, Pinelliae Rhizoma 6g, Trichosanthis Fructus 15g, Bupleuri Radix 12g, Aurantii Fructus Immaturus 10g, Platycodonis Radix 10g, Paeoniae Radix Rubra 15g	[124]
	Jinhua Center Hospital-prepared Prescription	Oral leukoplakia	Astragali Radix 30g, Atractylodis Macrocephalae Rhizoma 12g, Angelicae Sinensis Radix 9g, Cimicifugae Rhizoma 12g, Bupleuri Radix 12g, Citri Reticulatae Pericarpium 12g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 15g	[181]
	Kuerle Hospital-prepared Decoction	GC	Codonopsis Radix 15g, Astragali Radix Praeparata Cum Melle15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 10g, Poria 15g, Coicis Semen Recens 30g, Curcumae Rhizoma 10g, Hedyotidis Herba 15g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g, Agrimoniae Herba 15g, Aconiti Lateralis Radix Praeparata Praeparatum Cum Glycyrrhiza 10g, Ophiopogonis Radix 10g, Dendrobii Caulis 15g, Setariae Fructus Germinatus Tostus 15g	[117]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Lianqi Capsule	EC	Scutellariae Barbatae Herba, Patriniae Radix, Curcumae Rhizoma, Sparganii Rhizoma, Fritillariae Thunbergii Bulbus, Atractylodis Macrocephalae Rhizoma, Coicis Semen, Hirudo. Astragali Radix, Ginseng Radix et Rhizoma, Angelicae Sinensis Radix, Ligustri Lucidi Fructus, Glycyrrhizae Radix et Rhizoma	[42, 68]
	Liujunzi Plus Tengligen Tang	GC	Codonopsis Radix 10g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 10g, Poria 10g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g, Citri Reticulatae Pericarpium 6g, Pinelliae Rhizoma Praeparatus Cum Glycyrrhiza 6g, Actinidiae Chinensis Radix 30g	[108]
	Liu Jun Zi Tang	EC	Atractylodis Macrocephalae Rhizoma Amomi Fructus 10g, Cyperi Rhizoma 10g, Pinelliae Rhizoma Praeparatum Cum Zingibere 10g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 10g, Hordei Fructus Germinatus Torrefactionis 10g, Massa Medicata Fermentata Torrefactionis 10g, Crataegi Fructus Torrefactionis 10g, Pseudostellariae Radix 15g, Poria 15g, Dioscoreae Rhizoma Galli Gigerii Endothelium Coreneum 15g, Astragali Radix 20g, Jujubae Fructus 10	[74]
	Liushen Pill	ESCC	Bovis Calculus, Realgar, Margarita Pulveratum, Moschus, Borneolum Syntheticum, Bufonis Venenum	[40]
	Modified Liuwei Dihuang Decoction	EC	Rehmanniae Radix Preparata 18g, Corni Fructus 12g, Dioscoreae Rhizoma 15g, Moutan Cortex 9g, Poria 9g, Alismatis Rhizoma 9g, Astragali Radix Recens 30g, Coicis Semen Tostus 30g, Bletillae Rhizoma 20g, Forsythiae Fructus 12g, Lonicerae Japonicae Flos 12g, Paeoniae Radix Rubra 12g, Carthami Flos 9g, Spatholobi Caulis 15g, Pinelliae Rhizoma 9g	[31]
	Moluodan	Gastric precancerous lesions	Lilii Bulbus, Poria, Scrophulariae Radix, Linderae Radix, Alismatis Rhizoma, Ophiopogonis Radix, Angelicae Sinensis Radix, Atractylodis Macrocephalae Rhizoma, Artemisiae Scopariae Herba, Paeoniae Radix Alba, Dendrobii Caulis, Anemones Altaicae Rhizoma, Chuanxiong Rhizoma, Notoginseng Radix et Rhizoma, Sanguisorbae Radix, Corydalis Rhizoma, Typhae Pollen, Galli Gigerii Endothelium Coreneum	[193]
	Pingxiao Tablet	LSCC, EC	Curcumae Radix, Agrimoniae Herba, Trogopterori Faeces, Alumen, Nitrum, Toxicodendri Resina Usta, Fructus Aurantii Praparatus Cum Furfure, Strychni Semen	[17, 81, 82]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Qingdao Tumor Hospital-prepared Decoction	GC	Codonopsis Radix 30g, Atractylodis Macrocephalae Rhizoma 10g, Poria 10g, Amomi Fructus Rotundus 12g, Pinelliae Rhizoma 10g, Amomi Fructus 12g, Cyperi Rhizoma 10g, Citri Reticulatae Pericarpium 10g, Bambusae Caulis in Taenias 12g, Zingiberis Rhizoma Recens 5, Coicis Semen 15g	[109]
	Qizhu Fuzheng Tang	GC	Astragali Radix Praeparata Cum Melle 30g, Pinelliae Rhizoma Praeparatum Cum Glycyrrhiza 10g, Typhae Pollen Recens 10g, Paeoniae Radix Alba 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 10g, Poria 15g, Trogopterori Faeces 10g, Coicis Semen 30g, Corydalis Rhizoma 10g, Citri Reticulatae Pericarpium 10g, Cremastrae Pseudobulbus 9g, Amomi Fructus Rotundus 6g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[141]
	The Second Hospital of Jiaxing-prepared Decoction	GC	Pseudostellariae Radix 15g, Astragali Radix 30g, Coicis Semen 15g, Scutellariae Barbatae Herba 15g, Hedyotidis Herba 15g, Curcumae Rhizoma 15g, Atractylodis Macrocephalae Rhizoma15 g, Pinelliae Rhizoma Praeparatum Cum Glycyrrhiza 10g, Poria 10g, Dioscoreae Rhizoma 10g, Salviae Miltiorrhizae Radix et Rhizoma 10g, Citri Reticulatae Pericarpium 6g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 3g	[126]
	The Second People's Hospital of Luxian County-prepared Decoction	GC	Nelumbinis Folium 10g, Amomi Fructus Rotundus 3g, Atractylodis Macrocephalae Rhizoma 6g, Citri Sarcodactylis Fructus 6g, Codonopsis Radix 10g, Astragali Radix 10g, Dioscoreae Rhizoma 10g, Lilii Bulbus 10g, Epimedii Rhizoma 10g, Polygonati Odorati Rhizoma 10g	[143]
	Shenling Baizhu Tang	GC	Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 3g, Sparganii Rhizoma 10g, Curcumae Rhizoma 10g, Hedyotidis Herba 15g, Salviae Chinensis Herba 15g, Aucklandiae Radix 10g, Platycodonis Radix 10g, Angelicae Sinensis Radix 10g, Amomi Fructus 3g, Lablab Semen Album 10g, Pinelliae Rhizoma Praeparatum Cum Glycyrrhiza 10g, Nelumbinis Semen 5g, Paeoniae Radix Alba Tostus 10g, Coicis Semen 10g, Citri Reticulatae Pericarpium 6g, Atractylodis Macrocephalae Rhizoma Tostum Cum Furfure 10g, Dioscoreae Rhizoma 15g, Codonopsis Radix 15g, Poria 15g	[142]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Modified Sanjiasan	Premalignant Lesions of the Larynx	Manis Squama 15g, Trionycis Carapax 15g, Curcumae Rhizoma 10g, Sparganii Rhizoma 10g, Sargassum 10g, Laminariae Thallus 10g, Centellae Herba 10g, Persicae Semen5g, Cicadae Periostracum 5g, Carthami Flos 5g	[182]
	Sanleng Ezhu Decoction	GC	Codonopsis Radix 30g, Astragali Radix 30g, Coicis Semen 30g, Poria 15g, Rehmanniae Radix Recens 15g, Dendrobii Caulis 15g, Angelicae Sinensis Radix 15g, Notoginseng Radix et Rhizoma Pulveratum 6g, Cremastrae Pseudobulbus 15g, Scutellariae Barbatae Herba 15g, Hedyotidis Herba 30g, Sparganii Rhizoma 15g, Curcumae Rhizoma 15g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 10g	[130]
	Shenhu Banxia Decoction	GC	Ginseng Radix et Rhizoma 10g, Gekko 6g, Paridis Rhizoma 6-15g, Pinelliae Rhizoma Praeparatum Cum Zingibere 10 g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[78]
	Shenqi Fuzheng Injection	EC, GC	Codonopsis Radix, Astragali Radix	[147, 171]
	Shenqi Jianwei Decoction	GC	Coicis Semen 40g, Astragali Radix 25g, Codonopsis Radix 15g, Poria 10g, Atractylodis Macrocephalae Rhizoma 10g, Paeoniae Radix Rubra 10g, Pinelliae Rhizoma Praeparatum Cum Glycyrrhiza 10g, Platycodonis Radix 10g, Aurantii Fructus 10g, Citri Reticulatae Pericarpium 6g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 5g	[53]
	Shenqi Liuwei Dihuang Decoction	EC	Rehmanniae Radix Recens 30g, Rehmanniae Radix Preparata 30g, Dioscoreae Rhizoma 30g, Corni Fructus 30g, Moutan Cortex 10g, Poria10g, Alismatis Rhizoma 10g, Astragali Radix 30g, Panacis Quinquefolii Radix 30g	[32]
	Shenyi Jianzhong Decoction	GC	Codonopsis Radix 10g, Atractylodis Macrocephalae Rhizoma 10g, Curcumae Rhizoma 10g, Paeoniae Radix Alba 10g, Impatientis Semen 10g, Coicis Semen 15g, Salviae Chinensis Herba 15g, Scutellariae Barbatae Herba15 g (or Scutellariae Barbatae Herba 5g), Cinnamomi Ramulus 5g, Glycyrrhizae Radix et Rhizoma Recens 5g, Hedyotidis Herba 30g	[47, 48]
	Guangshan County People's Hospital-prepared Shenyi Jianzhong Tang	GC	Paeoniae Radix Alba 10g, Salviae Chinensis Herba 15g, Cinnamomi Ramulus 5g, Impatientis Semen 10g, Glycyrrhizae Radix et Rhizoma Recens 5g	[120]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	The First Affiliated Hospital of China Medical University-prepared Shenyi Jianzhong Tang	GC	Salviae Chinensis Herba 15g, Coicis Semen 15g, Codonopsis Radix 10g, Curcumae Rhizoma 10g, Impatientis Semen 10g, Atractylodis Macrocephalae Rhizoma 10g, Paeoniae Radix Alba 10g, Glycyrrhizae Radix et Rhizoma Recens 5g, Cinnamomi Ramulus 5g	[123]
	Modified Shenling Baizhu Tang	GC	Codonopsis Radix 10g, Astragali Radix 35g, Atractylodis Macrocephalae Rhizoma 15g, Poria 15g, Angelicae Sinensis Radix 10g, Coicis Semen 35g, Lablab Semen Album 15g, Platycodonis Radix 10g, Nelumbinis Semen 10g, Citri Reticulatae Pericarpium 10g, Dioscoreae Rhizoma 15g, Amomi Fructus 5g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 10g	[105]
	Shenmai Injection	EC	Ginseng Radix et Rhizoma Rubra, Ophiopogonis Radix	[168–170]
	Shengxue Tang	GC	Astragali Radix Recens 30g, Pseudostellariae Radix 15g, Atractylodis Macrocephalae Rhizoma 10g, Poria 10g, Pinelliae Rhizoma 12g, Zingiberis Rhizoma Recens 3g, Carthami Flos 10g, Ligustri Lucidi Fructus 15g, Cuscutae Semen 15g, Lycii Fructus 15g, Spatholobi Caulis 30g, Asini Corii Colla 6g	[89]
	Shenzhu Jianyun Tiaoqi Tang	EC	Astragali Radix 20g, Atractylodis Macrocephalae Rhizoma9g, Pinelliae Rhizoma 6g, Ginseng Radix et Rhizoma 6g, Citri Reticulatae Pericarpium 6g, Glycyrrhizae Radix et Rhizoma 3g, Poria 20g, Bupleuri Radix 15g, Aurantii Fructus 15g, Cyperi Rhizoma 15g, Amomi Fructus 15g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 15g, Citri Sarcodactylis Fructus 10g, Albiziae Flos 10g, Paeoniae Radix Alba 10g	[132]
	Shenzhu Jiedu Decoction	GC	Codonopsis Radix 30g, Atractylodis Macrocephalae Rhizoma 15g, Trichosanthis Radix 10g, Ophiopogonis Radix 10g, Bambusae Caulis in Taenias Praeparatus Cum Zingmber 6g, Pinelliae Rhizoma Praeparatus Cum Zingmber 10g, Haematitum Ustionis 10g, Setariae Fructus Germinatus Tostus 15g, Hordei Fructus Germinatus Tostus 10g, Hedyotidis Herba 30g, Taraxaci Herba 30g, Coptidis Rhizoma Tostus 6g, Glycyrrhizae Radix et Rhizoma Recens 6g	[75]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Shidao Tongjie Formula	EC	Codonopsis Radix 15g, Aurantii Fructus Immaturus 15g, Gekko 9g, Impatientis Semen 15g, Salviae Chinensis Herba 30g, Arisaematis Rhizoma Preparatum 15g, Chebulae Fructus Fremat 15g	[64]
	Shidao Tongjie Granule	EC	Codonopsis Radix, Impatientis Semen, Gekko, Salviae Chinensis Herba, Arisaematis Rhizoma Preparatum, Chebulae Fructus, Ponciri Fructus	[65, 66]
	Shiyiwei Shenqi Tang	GC	Ginseng Radix et Rhizoma 10g, Astragali Radix 30g, Gastrodiae Rhizoma 8g, Angelicae Sinensis Radix 15g, Rehmanniae Radix Preparata 30g, Alismatis Rhizoma 12g, Cassiae Semen 8g, Cuscutae Semen 8g, Cervi Cornus Colla 6g, Lycii Fructus 12g, Asari Radix et Rhizoma 3g	[104]
	Si Jun Zi Tang	EC	Ginseng Radix et Rhizoma 10g, Atractylodis Macrocephalae Rhizoma 9g, Poria 9g, Glycyrrhizae Radix et Rhizoma Praeparata cum Melle 6g	[33]
	Sishen Jiedu Decoction	EC	Astragali Radix 30g, Ginseng Radix et Rhizoma 15g, Panacis Quinquefolii Radix 15g, Sophorae Flavescentis Radix 15g, Rehmanniae Radix Preparata 15g, Angelicae Sinensis Radix 15g, Hedyotidis Herba 15g, Moutan Cortex 15g, Polygoni Cuspidati Rhizoma et Radix 15g, Scrophulariae Radix 10g, Rabdosiae Rubescentis Herba 10g, Curcumae Rhizoma 10g, Pinelliae Rhizoma 10g, Glycyrrhizae Radix et Rhizoma 10g	[35, 36, 57]
	Tongye Tang	GC	Codonopsis Radix 20g, Rabdosiae Rubescentis Herba 30g, Actinidiae Chinensis Radix 20g, Sophorae Tonkinensis Radix et Rhizoma 20g, Spatholobi Caulis 20g, Acanthopanacis Senticosi Radix et Rhizoma Sue Caulis 15g, Curcumae Radix 9g, Hordei Fructus Germinatus Torrefactionis 15g, Massa Medicata Fermentata Torrefactionis 15g, Crataegi Fructus Torrefactionis 15g	[73]
	Weifu Tang	GC	Astragali Radix 20g, Codonopsis Radix 15g, Atractylodis Macrocephalae Rhizoma 10g, Poria 10g, Cyperi Rhizoma 10g, Curcumae Radix 10g, Sappan Lignum 10g, Curcumae Rhizoma 10g, Paridis Rhizoma 9g, Scutellariae Barbatae Herba 10g, Ligustri Lucidi Fructus 10g, Cuscutae Semen 10g, Hordei Fructus Germinatus Tostus 15g, Setariae Fructus Germinatus Tostus 15g, Galli Gigerii Endothelium Coreneum 9g, Glycyrrhizae Radix et Rhizoma 5g	[110]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Weifuchun Tablet	Gastric precancerous lesions	Ginseng Radix et Rhizoma Rubra, Rabdosiae Amethystoidis Herba, Aurantii Fructus Praparatus Cum Furfure	[191]
	Weining Granule	GC	Astragali Radix, Poria, Curcumae Rhizoma, Lycii Fructus	[148]
	Weiyanfu Formula	Gastric precancerous lesions	Violae Inconspiculae Herba 15g, Taraxaci Herba 15g, Ilicis Rotundae Cortex 15g, Pinelliae Rhizoma 10g, Scutellariae Radix 15g, Corydalis Rhizoma 15g, Sepiae Endoconcha 30g, Notoginseng Radix et Rhizoma 10g, Hedyotidis Herba 15g, Massa Medicata Fermentata 15g	[194]
	Wenyang Huazheng Tang	GC	Astragali Radix 30g, Epimedii Folium 20g, Colla Cornus Cervi 18, Cistanches Herba 10g, Panacis Quinquefolii Radix 6g, Asini Corii Colla 6g, Cremastrae Pseudobulbus 5g, Hirudo 3g, Scorpio 2g, Scolopendra 2g, Poria 3g, Curcumae Rhizoma 3g	[91]
	Xianchan Tablet	EC	Strychni Semen, Bufonis Venenum, Psoraleae Fructus, Pinelliae Rhizoma Praeparatum Cum Glycyrrhiza, Curcumae Radix, Ginseng Radix et Rhizoma, Astragali Radix, Angelicae Sinensis Radix, Agrimoniae Herba	[152]
	Xiangsha Bazhen Decoction	EC	Astragali Radix 20g, Ginseng Radix et Rhizoma 15g, Poria 15g, Rehmanniae Radix Preparata 20g, Chuanxiong Rhizoma 10g, Atractylodis Macrocephalae Rhizoma 10g, Angelicae Sinensis Radix 12g, Aucklandiae Radix 12g, Citri Reticulatae Pericarpium 10g, Paeoniae Radix Alba 8g, Amomi Fructus 8g, Cimicifugae Rhizoma 12g, Bupleuri Radix 12g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[34]
	Xiangsha Liujunzi Tang	GC	Ginseng Radix et Rhizoma, Atractylodis Macrocephalae Rhizoma, Poria, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle, Citri Reticulatae Pericarpium,Pinelliae Rhizoma, Amomi Fructus, Aucklandiae Radix (or add Zingiberis Rhizoma Recens)	[79, 94]
	Modified Xiangsha Liujunzi Decoction	GC	Codonopsis Radix 15g, Atractylodis Macrocephalae Rhizoma 10g, Poria 12g, Aucklandiae Radix 7g, Amomi Fructus 10g, Astragali Radix Recens 24g, Dioscoreae Rhizoma 15g, Salviae Miltiorrhizae Radix et Rhizoma 10g, Paeoniae Radix Rubra 10g, Crataegi Fructus 15g, Glycyrrhizae Radix et Rhizoma 3g	[160]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Xiaoai Decoction	GC	Hedyotidis Herba 20g, Scolopendra 6g, Scutellariae Barbatae Herba 15g, Cremastrae Pseudobulbus 15g, Pseudostellariae Radix 20g	[50]
	Xinye County Hospital of Traditional Chinese Medicine-prepared Decoction	GC	Galli Gigerii Endothelium Coreneum 10g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 5g, Curcumae Rhizoma 10g, Astragali Radix 30g, Atractylodis Macrocephalae Rhizoma 15g, Euodiae Fructus 10g, Codonopsis Radix 15g, Pinelliae Rhizoma 10g, Poria 15g, Lablab Semen Album 30g, Aurantii Fructus 5g, Zingiberis Rhizoma 5g, Citri Reticulatae Pericarpium 5g	[92]
	Xuanfu Daizhe Tang	EC	Inulae Flos 15g, Haematitum 12g, Pinelliae Rhizoma 12g, Ginseng Radix et Rhizoma 6g, Angelicae Sinensis Radix 10g, Paeoniae Radix Alba 9g, Citri Reticulatae Pericarpium 9g, Bupleuri Radix 12g, Curcumae Radix 9g, Toosendan Fructus 15g, Arcae Concha 12g, Glycyrrhizae Radix et Rhizoma 9g	[61]
	Xuefu Zhuyu Decoction	EC	Angelicae Sinensis Radix 10g, Rehmanniae Radix Recens 10g, Carthami Flos 10g, Achyranthis Bidentatae Radix 10g, Persicae Semen 12g, Aurantii Fructus 6g, Paeoniae Radix Rubra 6g, Chuanxiong Rhizoma 4g, Platycodonis Radix 4g, Bupleuri Radix 3g, Glycyrrhizae Radix et Rhizoma 3g	[37]
	Modified Xuezheng Decoction	GC	Sparganii Rhizoma 15g, Curcumae Rhizoma 15g, Hedyotidis Herba 15g, Smilacis Chinae Rhizoma 15g, Angelicae Sinensis Radix 10g, Paeoniae Radix Rubra 10g, Olibanum 5g, Myrrha 5g, Cinnamomi Ramulus 5g	[101]
	Yangzheng Xiaoji Capsule	EC	Astragali Radix, Ligustri Lucidi Fructus, Ginseng Radix et Rhizoma, Curcumae Rhizoma, Ganoderma, Gynostemmatis Pentaphylli Herba seu Radix, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure, Scutellariae Barbatae Herba, Hedyotidis Herba, Poria, Eupolyphaga Steleophaga, Galli Gigerii Endothelium Coreneum, Duchesnea Herba, Solani Lyrati Herba, Artemisiae Scopariae Herba, Cynanchi Paniculati Radix et Rhizoma	[38, 46]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Yangzheng Sanjie Decoction	GC	Astragali Radix 25g, Ginseng Radix et Rhizoma 13g, Plantaginis Semen 18g, Eucommiae Cortex 15g, Lycii Cortex 12g, Zingiberis Cortex Recens 2g, Alismatis Rhizoma 12g, Psoraleae Fructus 8g, Cinnamomi Cortex 3g, Zanthoxyli Pericarpium 10g, Poria 25g, Mantidis Ootheca 8g, Aconiti Lateralis Radix Praeparata Tosta 8g	[44]
	Ye Ge Yin No.2	EC	Glehniae Radix 15g, Ophiopogonis Radix 15g, Bambusae Caulis in Taenias 30g, Hedyotidis Herba 15g, Smilacis Chinae Rhizoma 15g, Angelicae Sinensis Radix 12g, Polygonati Odorati Rhizoma 12g, Rehmanniae Radix Recens 10g, Dendrobii Caulis 10g, Glycyrrhizae Radix et Rhizoma 6g	[62]
	Yiqi Jiedu Tang	GC	Astragali Radix 30g, Codonopsis Radix 20g, Gekko 20g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Poria 15g, Paridis Rhizoma 10g, Bambusae Caulis in Taenias Praeparatus Cum Zingmber 10g, Citri Reticulatae Pericarpium 10g, Inulae Flos 10g, Pinelliae Rhizoma Praeparatum Cum Zingibere 10g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[133]
	Yiyang Jianpi Formula	GC	Pseudostellariae Radix 15g, Atractylodis Macrocephalae Rhizoma Tostum Cum Melle Et Furfure 15g, Setariae Fructus Germinatus Tostus 15g, Hedyotidis Herba 15g, Massa Medicata Fermentata 15g, Galli Gigerii Endothelium Coreneum 15g, Astragali Radix Recens 20g, Poria 10g, Pinelliae Rhizoma Praeparatum Cum Zingibere 10g, Cinnamomi Ramulus 10g, Zingiberis Rhizoma Praeparatum 6g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 6g	[180]
	Yunnan Provincial Hospital of Traditional Chinese Medicine-prepared Decoction	GC	Coicis Semen 30g, Actinidiae Chinensis Radix 30g, Sargentodexae Caulis 30g, Ampelopsis Sinicae Caulis 30g, Poria 20g, Codonopsis Radix 15g, Sophorae Flavescentis Radix 15g, Agastaches Herba 15g, Eupatorii Herba 15g, Amomi Fructus Rotundus 15g, Astragali Radix 15g, Atractylodis Macrocephalae Rhizoma 15g, Amomi Fructus 12g, Pinelliae Rhizoma 9g, Coptidis Rhizoma 6g	[84]
	Zengshengping	Oral leukoplakia /Esophageal epithelial hyperplasia	Sophorae Tonkinensis Radix et Rhizoma, Bistortae Rhizoma, Sonchi Arvensis Herba, Prunellae Spica, Dictamni Cortex, Dioscoreae Bulbiferae Rhizoma	[184, 185]

Table 3 (continued)

Drug types	Chinese herbal drug	Cancer type/ Precancerous condition	Ingredients	Ref.
	Zibo Hospital of Traditional Chinese Medicine-prepared Prescription	GC	Mylabris, Bufonis Venenum, Scorpio, Hirudo, Smilacis Chinae Rhizoma, Actinidiae Chinensis Radix, Solani Nigri Herba, Cremastrae Pseudobulbus , Curcumae Rhizoma, Astragali Radix, Pseudostellariae Radix, Amomi Fructus, Aucklandiae Radix	[111]
	Zisheng Xiexin Tang	GC	Pinelliae Rhizoma Praeparatum Cum Alumine 30g, Glycyrrhizae Radix et Rhizoma Praeparata Cum Melle 30g, Coptidis Rhizoma 10g, Scutellariae Radix 10g, Zingiberis Rhizoma 10g, Ginseng Radix et Rhizoma 10g, Jujubae Fructus 10g, Dioscoreae Rhizoma 30 g, Atractylodis Macrocephalae Rhizoma 10g, Scrophulariae Radix 10g, Kaki Mannosum 3g, Arctii Fructus 10g	[125]
Single herb-based CHD				
	Bruceae Fructus Oil Injection, Bruceae Fructus Oil Oral Liquid	EC, GC	Bruceae Fructus	[14–16, 77, 131, 161]
	Danshen Injection	GC	Salviae Miltiorrhizae Radix et Rhizoma	[93]
	Huachansu Capsule	EC	Bufonis Corium	[29, 140, 172]
	Huaier Keli	GC	Trametes robiniophila Murr	[174]
	Huangqi Injection	GC	Astragali Radix	[93]
	Kanglaite Injection	GC	Coicis Semen oil	[30, 85, 127, 175, 176]
	Xiao'aiping Injection, Xiaoaiping Tablet, Tongguanteng Oral Solution, Tongguanteng Oral Liquid	EC	Marsdeniae Tenacissimae Caulis	[58, 59, 71, 173]
Phytocompound-based CHD			Natural Resources	
	Astragalus Polysaccharide Injection	ESCC, GC	Astragalus Polysaccharides	[41, 135]
	Aiyishu Injection	EC	Disodium Cantharidinate	[23]
	Elemene Injection	EC, GC	β-, γ-, δ-elemene, from Chrysanthemi Flos or Curcumae Rhizoma	[24, 25, 102]
	Irisquinone Capsule	EC	Irisquinone	[19, 20]
	Matrine, Matrine Injection	GC	Sophorae Flavescentis Radi	[80]
	Shenyi Capsule	EC	Ginsenoside Rg3	[153]
	Yunzhitangtai Capsule	EC	Polysaccharopeptides	[69, 70]

function, evidenced by increased $CD4^+$ T cells and $CD4^+/CD8^+$ratio, and significantly reduced occurrence rate of esophagitis, compared to the mono radiotherapy. Of 76 patients, only one experienced Bruceae Fructus Oil Injection-induced fever [14]. In another study designed to assess the efficacy and safety of Bruceae Fructus Oil Injection in combination with radiotherapy in advanced esophageal cancer patients, the combination therapy exhibited higher 1-year and 2-year survival rates than single radiotherapy (1-year survival rate: 63.3% vs. 46.7%; 2-year survival rate: 33.3% vs. 20%). The combined treatment group had a higher white blood cell (WBC) count than the radiotherapy group. Among the 30 patients, only two experienced drug-associated fever [15]. Bruceae Fructus Oil Oral Liquid is an oral form PHD prepared with Bruceae Fructus Oil. In esophageal cancer patients, Bruceae Fructus Oil Oral Liquid combined with radiotherapy exhibited a higher objective response rate (ORR) than radiotherapy alone (77.5% vs. 47.5%). Patients receiving the combined therapy had a higher Karnofsky Performance Scale (KPS) score than those receiving radiotherapy alone, indicating that this PHD improved patients' quality of life (QOL). In addition, Bruceae Fructus Oil Oral Liquid co-treatment reduced the incidence of radiotherapy-induced adverse effects, including myelosuppression (12.5% vs. 30%), nausea/vomiting (20% vs. 42.5%), as well as radiation esophagitis and pneumonitis (27.5% vs. 32.5%) [16]. Findings of these studies demonstrate that Bruceae Fructus Oil-based drugs can enhance the efficacy, and reduce the toxicities of radiotherapy, and can improve patients' QOL in treating esophageal cancer [14, 15].

Pingxiao Tablet, an NMPA-approved anticancer drug developed based on the TCM theory of regulating blood [196], in combination with radiotherapy, significantly increased 1-, 3-, and 5-year survival rates of middle- and late-stage esophageal cancer patients compared to mono radiotherapy (1-year survival rate: 49% vs. 39.6%; 3-year survival rate: 32.1% vs. 17%; 5-year survival rate: 18.9% vs 9.4%) [17].

Huisheng Koufuye (Oral Liquid) was initially approved for treating liver and lung cancers in China [197]. A clinical trial showed that, in patients with esophageal cancer, radiotherapy plus Huisheng Koufuye (Oral Liquid) resulted in higher complete remission (CR) and 1-year survival rate compared to radiotherapy alone (CR: 71.7% vs. 45.7%; 1-year survival rate: 67.4% vs. 43.5%) [18]. Drug administration-associated adverse events were not observed in any of the 46 patients.

Irisquinone Capsule is an NMPA-approved radiosensitizer [198]. One study showed that Irisquinone Capsule plus radiotherapy group had higher 1- and 3-year survival rates than the mono radiotherapy group (1-year survival rate: 73.8% vs. 47.7%; 3-year survival rate: 35.4% vs 18.5%) in esophageal cancer patients [19]. Another study showed that Irisquinone Capsule significantly sensitized radiotherapy in esophageal cancer patients, evidenced by increased CR (combined therapy 80% vs. radiotherapy alone 40%) and 1-year survival rate (75% vs. 56.7%) [20]. In both studies, only mild gastrointestinal (GI) side effects (without affecting treatment adherence) associated with the use of Irisquinone Capsule were observed [19, 20].

Fuzheng Kangai Jiedu Formula (a 19-herb prescription created by a TCM doctor) combined with radiotherapy resulted in significantly longer progression-free survival (PFS) and median overall survival (mOS) of esophageal cancer patients than single radiotherapy (PFS: 12 months vs. 8 months; mOS: 23 months vs. 19 months). After a 4-month treatment, the combination therapy showed significantly better effects in lowering the serum levels of the tumor markers cytokeratin 19 fragment (CYFRA21-1) and glycochain antigen 19-9 (CA19-9). Moreover, the formula enhanced the immune function of esophageal cancer patients receiving radiotherapy, evidenced by increased $CD3^+$ and $CD4^+$ T cells, and decreased $CD8^+$ T cells in the combined treatment group compared to those in the mono radiotherapy group [21].

Fuzheng Guben Granule (based on a 13-herb prescription created by a TCM doctor) in combination with radiotherapy achieved significantly higher CR and 1-, 3-, and 5-year survival rates in patients with middle- and late-stage esophageal cancer, compared to single radiotherapy (CR: combined therapy 62.1% vs. radiotherapy 44.0%. 1-year survival rate: 63.8% vs. 41.4%; 3-year survival rate: 29.3% vs. 14.7%; 5-year survival rate: 19.0% vs 7.6%). Meanwhile, significantly increased WBC counts, haemoglobin (Hb) content, and platelete counts, as well as significantly reduced occurrence rate of esophagitis, were observed in the combined therapy group compared to the mono radiotherapy group [22].

Aiyishu Injection is an NMPA-approved anticancer drug comprising of sodium cantharidate and vitamin B6. Combining this drug with radiotherapy significantly increased disease control rate (DCR) in patients with esophageal cancer (combined therapy 81.39% vs. radiotherapy 58.14%) [23].

Elemene Injection is an anticancer PHD comprising β-, γ-, and δ-elemene isolated from Curcumae Rhizoma. In two studies, combined use of Elemene Injection and radiotherapy resulted in a significantly higher ORR than single radiotherapy (97.5% vs. 80% [24] and 63.33% vs. 36.67% [25]) in patients with esophageal cancer. More $CD4^+$ and $CD3^+$ T cells, higher WBC count and $CD4^+/CD8^+$ ratio, as well as less $CD8^+$ cells, were observed in the combined treatment group than in the mono

radiotherapy group. The combination effectively lowered serum levels of the tumor markers CEA and CA19-9 more than radiotherapy alone. In addition, a higher KPS score was achieved in patients of the combination group, indicating that Elemene Injection improved QOL of patients undergoing radiotherapy [24, 25].

Fufang Danshen Injection was initially approved in China for treating coronary heart disease, angina pectoris and acute myocardial infarction. An article reported that Fufang Danshen Injection in combination with radiotherapy exhibited higher ORR than single radiotherapy in esophageal cancer patients (88.9% vs. 76.2%). It also increased the WBC count and improved the transcription activity of rDNA in the peripheral lymphocytes of patients receiving radiotherapy, indicating that it can enhance immune function of the patients [26].

Fufang Kushen Injection is an NMPA-approved anticancer adjuvant drug prepared with Sophorae Flavescentis Radix and Heterosmilacis Rhizoma. A clinical trial showed that, in patients with esophageal cancer, radiotherapy plus Fufang Kushen Injection resulted in higher CR compared to radiotherapy alone (33.3% vs. 10%). Patients in the combined treatment group exhibited better appetite, higher KPS score, and greater body weight gain than patients in the radiotherapy group, indicating that this injection improved the QOL of patients undergoing radiotherapy [27].

Fuzheng Yiliu Granule (based on a 4-herb prescription created by a TCM doctor), combined with radiotherapy resulted in a higher rosette rate of the red cell C3b receptor (RBC-C3bRR) and lower red blood cell immune complex rosette rate (RBC-ICRR) in esophageal cancer patients than single radiotherapy, indicating that it enhanced the immune function of cancer patients receiving radiotherapy. Moreover, this prescription significantly lowered the tumor metastatic marker CD44v6 in patients receiving radiotherapy [28].

Huachansu Capsule is a PHD prepared from the lipophilic components of Bufonis Corium. This drug in combination with radiotherapy achieved significantly higher ORR than single radiotherapy in treating esophageal cancer (89.47% vs. 68.42%). Meanwhile, the incidence of adverse effects (leukopenia, esophagitis, nausea, and myalgia) was lower in patients receiving the combined treatment compared to those receiving radiotherapy alone [29].

Kanglaite Injection is an NMPA-approved anticancer drug prepared from the oil of Coicis Semen. A study showed that the incidence of adverse reactions (fatigue, leukopenia and loss of appetite) caused by radiotherapy in esophageal cancer patients was significantly decreased by Kanglaite Injection [30].

Modified Liuwei Dihuang Decoction is an 8-herb prescription created by a TCM doctor. It improved the immune function of esophageal cancer patients receiving radiotherapy ($CD4^+/CD8^+$ ratio: combined therapy 1.4 vs. radiotherapy 1.2). Meanwhile, this prescription decreased the incidence of radiotherapy-induced adverse effects from 83.3% to 56.7%, and significantly improved the physical power of the patients [31].

Shenqi Liuwei Dihuang Decoction is an 8-herb prescription created by a TCM doctor. It has been shown to enhance the efficacy of radiotherapy in esophageal cancer patients. The ORR was higher in Shenqi Liuwei Dihuang Decoction plus radiotherapy group than in the mono radiotherapy group (81.8% vs. 75.5%). Patients in the combined treatment group had a lower probability of suffering from radiotherapy-induced adverse effects compared to patients in the mono-radiotherapy treatment group [32].

Si Jun Zi Tang, a classical TCM formula, is commonly used by TCM doctors for tonifying Qi. A study showed that this formula enhanced the clinical efficacy of radiotherapy in esophageal cancer patients, evidenced by an elevated ORR (combined therapy 62.5% vs. radiotherapy 37.5%) [33].

Xiangsha Bazhen Decoction is a 14-herb prescription created by a TCM doctor. This prescription has been proven to markedly increase $CD4^+$ T cells and decrease $CD8^+$ T cells in esophageal cancer patients receiving radiotherapy, suggesting that it enhanced the immune function of the patients. The incidence of adverse effects (vomiting and leukopenia) caused by radiotherapy was significantly reduced by the prescription [34].

In two reports, Sishen Jiedu Decoction (a 14-herb prescription created by a TCM doctor) combined with radiotherapy achieved significantly higher ORR (93.33% vs. 73.33% in one report, 92% vs. 75% in the other report) in the treatment of esophageal cancer compared to radiotherapy alone. Meanwhile, the prescription significantly reduced the occurrence rates of radiotherapy-induced adverse effects (radiation esophagitis, radiation pneumonitis, leukopenia and thrombocytopenia). QOL of patients receiving combined treatment was better than that of patients receiving radiotherapy only [35, 36].

Xuefu Zhuyu Decoction is a classical TCM formula that can protect esophageal cancer patients from radiotherapy-induced myelosuppression. Higher WBC, RBC and platelet counts were observed in the combined treatment group than in the mono radiotherapy group [37].

Yangzheng Xiaoji Capsule is a PHD that has been demonstrated to improve the QOL of esophageal cancer patients undergoing radiotherapy. The Quality of Life Questionnaire-Core 30 (QLQ-C30) and Quality of Life

Questionnaire-Oesophageal Module 18 (QLQ-OES18) symptom scores were lower in the combination treatment group than in the radiotherapy group [38].

Antike Capsule, an NMPA-approved adjuvant drug for treating ESCC, combined with radiotherapy resulted in a significantly higher ORR in the treatment of ESCC than single radiotherapy (96.9% vs. 78.1%). Clinical symptoms of the ESCC patients, including eating disorders, chest pain and back pain, disappeared more quickly in the combined treatment group than in the mono radiotherapy group. Drug treatment-associated nausea was observed [39].

Liushen Pill is another PHD that can improve the efficacy of radiotherapy in ESCC treatment. Liushen Pill in combination with radiotherapy achieved significantly higher ORR than radiotherapy alone (75.76% vs. 50.0%). It also down-regulated vascular endothelial growth factor (VEGF) expression and reduced microvessel density in ESCC patients receiving radiotherapy, indicating that the combination therapy exhibited better anti-angiogenic effects in ESCC patients than radiotherapy alone [40].

Astragalus Polysaccharide Injection is a PHD prepared with the TCM herb Astragali Radix. It can increase ORR in ESCC patients receiving radiotherapy (76.6% vs. 50.0%). Patients receiving combined treatment had higher KPS score and greater body weight gain than patients receiving radiotherapy alone, indicating that the injection improved patients' QOL [41].

Lianqi Capsule is a PHD used for treating lung, liver, and esophageal cancers. In advanced ESCC patients, the combination of Lianqi Capsule and radiotherapy significantly lowered serum levels of three tumor markers (CEA, SCC-Ag, and CYFRA21-1), and showed more potent effects than radiotherapy alone. Meanwhile, this PHD improved the immune function of ESCC patients receiving radiotherapy, indicated by higher $CD4^+$ T cell count, lower $CD8^+$ cell count and higher $CD4^+/CD8^+$ ratio in the combined treatment group compared to the radiotherapy group [42].

Modified Fuzheng Guben Quxie Decoction (a 13-herb prescription created by a TCM doctor) combined with radiotherapy achieved longer PFS and mOS, as well as higher 1-year survival rate in stage III-IV gastric cancer treatment compared to radiotherapy alone. In the combined treatment group, serum levels of the tumor markers CEA, CA19-9, and macrophage inflammatory protein 3α (MIP-3α, also known as CCL20), and the score of patient-generated subjective global assessment (PG-SGA, a patient-reported instrument for assessment of nutritional risk and nutritional deficit in patients with cancer) were lower compared to the radiotherapy group. It was also demonstrated that $CD3^+$ and $CD4^+$ T cells were more, and $CD4^+/CD8^+$ ratio was higher in the combined treatment group than in the mono radiotherapy group, indicating that this herbal prescription enhanced immune function of the gastric cancer patients receiving radiotherapy [43].

Yangzheng Sanjie Decoction is a 13-herb prescription created by a TCM doctor. This decoction in combination with radiotherapy resulted in a higher DCR than radiotherapy alone (97.56% vs. 82.50%). The combination therapy more effectively lowered serum levels of three tumor markers in gastric cancer patients: CEA, VEGF, and CD44v6, compared to radiotherapy alone. Higher serum motilin level, and lower serum D-lactic acid level were observed in the combination treatment group than in the radiotherapy group, indicating that this CHD improved the GI function of patients receiving radiotherapy [44].

In patients receiving chemotherapy

A total of 114 eligible clinical studies tested the clinical use of 104 CHDs as adjuvants to chemotherapies in cancer patients (22 studies on esophageal cancer, 90 on gastric cancer, and 2 on laryngeal cancer). In one of the clinical trials, potential anticancer mechanisms of Liu Jun Zi Tang were explored. Among the 104 CHDs, 28 are NMPA-approved PHDs.

In patients receiving fluoropyrimidine-based chemotherapeutics

5-fluorouracil (5-FU) and its oral prodrugs, such as tegafur, S-1, and capecitabine, are widely used in the treatment of various cancers including upper digestive tract cancers. Twelve eligible studies reported the combinational use of individual fluoropyrimidine-based chemotherapeutics and CHDs for treating gastric cancer.

Bo-Er-Ning Capsule (BENC), derived from an 11-herb prescription, is a PHD approved as an adjuvant to cancer therapies in China. It was reported that the ORR of stage IV gastric cancer patients was higher in the group treated with the combination of BENC and S-1 than in the group treated with S-1 alone (56.67% vs. 36.67%) [45]. Forty percent of patients in the combination therapy group showed a >10% increase in KPS score, compared to 13% in the S-1 monotherapy group. The incidence of myelosuppression (23.33% vs. 50%) and GI disorders (26.67% vs. 43.33%) was lower in the combined therapy group than in the S-1 monotherapy group. This study suggests that BENC can enhance the anti-gastric cancer effects of S-1, mitigate S-1-induced side effects, and improve QOL of the patients.

Another report showed that Yangzheng Xiaoji Capsule (a PHD), combined with capecitabine, lowered serum level of the tumor marker CEA in gastric cancer

patients more effectively than capecitabine alone [46]. The patients in the combination group had a higher QLQ-C30 function score compared to patients in the capecitabine monotherapy group. These results indicate that the TCM capsule enhanced the anticancer efficacy of capecitabine, and enhanced QOL of the patients.

Two clinical trials tested Shenyi Jianzhong Decoction (an 11-herb prescription created by a TCM doctor) in combination with S-1 for treating gastric cancer [47, 48]. The ORR of patients was higher in the combination group than in the S-1 group. Patients in the combination group showed a greater increase in KPS score compared to the S-1 group, indicating that this herbal prescription enhanced the anti-gastric cancer efficacy of S-1 and improved patients' QOL.

Fuzheng Jiedu Quyu Method-based Formula (FJQR) is a 6-herb prescription from the First Teaching Hospital of Tianjin University of Traditional Chinese Medicine. FJQR combined with capecitabine improved the ORR of patients with advanced HER-2 negative gastric cancer (9.4% vs. 6.2%). The incidence of grade III-IV adverse events, including leukopenia, anemia, and nausea/vomiting, was lower in the combination group compared to the capecitabine monotreatment group [49].

Xiaoai Decoction (a 5-herb prescription created by a TCM doctor) in combination with 5-FU increased the ORR of postoperative gastric cancer patients (combination therapy vs. 5-FU alone: 89.8% vs. 75.5%) [50]. The combination therapy group showed higher 1-year (87.2% vs. 76.1%) and 2-year (19.1% vs. 10.8%) survival rates, and longer PFS (20.98 months vs. 18.71 months) and mOS (18.41 months vs. 16.51 months) compared to the 5-FU monotherapy group, indicating that Xiaoai Decoction potentiates the anticancer efficacy of 5-FU.

Some CHDs have also been shown to enhance the anticancer efficacy of fluoropyrimidines. For instance, Buyang Huanwu Tang (a classical TCM formula) combined with 5-FU resulted in a higher 5-year survival rate compared to 5-FU alone in gastric cancer patients (12.5% vs. 0%) [51]; Fufang Hongdoushan Capsule (a PHD approved as an adjuvant to cancer therapies) combined with S-1 showed increased ORR in gastric cancer patients compared to S-1 monotherapy (60% vs. 43.3%) [52]; Shenqi Jianwei Decoction (an 11-herb prescription created by a TCM doctor) combined with S-1 achieved a higher ORR in gastric cancer patients, compared to S-1 monotherapy (90% vs. 60%) [53]; and Jiawei Lizhong Decoction (a 5-herb prescription created by a TCM doctor) combined with S-1 resulted in a higher ORR compared to S-1 alone (82.22% vs. 62.22%) in gastric cancer patients, and the combination also reduced nausea and vomiting caused by S-1 [54]. The Japanese herbal medicine Hochu-ekki-to (whose composition is the same as the classical TCM formula Buzhong Yiqi Tang) was reported to reduce the occurrence of adverse events, including thrombocytopenia, nausea, vomiting, diarrhea, and appetite loss caused by S-1 treatment in stage II/III gastric cancer patients [55]. Jianpi Huazheng Decoction (a 19-herb prescription created by a TCM doctor) did not enhance the anticancer efficacy of tegafur in gastric cancer, but it was able to increase patient KPS score (the decoction + tegafur vs. tegafur alone: 72.12 vs. 65.98) [56], indicating a QOL benefit in patients.

In patients receiving CF regimen

Cisplatin in combination with 5-FU, commonly referred to as CF regimen, is one of the recommended therapies for locally advanced esophageal cancer. Six reports studied the combination of CHDs and CF regimen for treating esophageal cancer.

Sishen Jiedu Decoction combined with CF regimen resulted in a higher ORR in stage II-III esophageal cancer patients compared to CF regimen alone (90.48% vs 69.05%) [57]. The 1-year, 3-year, and 5-year survival rates of patients receiving the decoction-plus-CF regimen were 88.10%, 71.43%, and 52.38%, respectively, and those of patients who only received CF regimen were 66.67%, 45.24%, and 28.57%, respectively. The incidence of adverse effects such as leukopenia and thrombocytopenia was lower, and the KPS score was higher, in the combined treatment group than in the CF regimen group.

Another CHD that has been shown to enhance the efficacy of CF regimen is Tongguanteng Oral Solution [58], a PHD approved by the NMPA of China. Combination of this oral solution with CF regimen elevated the ORR of stage II-IV esophageal cancer patients (the oral solution + CF regimen vs. CF regimen: 75% vs. 52.5%). Patients receiving the oral solution-plus-CF regimen demonstrated a marked increase in peripheral NK cells and $CD4^+/CD8^+$ ratio, compared to the patients receiving CF regimen alone. In addition, the incidence of leukopenia, thrombocytopenia, and nausea/vomiting was significantly lower in the combined treatment group than in CF regimen group.

Xiaoaiping Tablet and Tongguanteng Oral Solution both are PHDs developed from the extracts of Caulis Marsdeniae Tenacissimae (Tongguanteng), the dry rattan stem of *Marsdenia tenacissima* (Roxburgh) Moon. Compared to the CF regimen alone, the combination of Xiaoaiping Tablet and CF regimen increased peripheral NK cells and $CD4^+/CD8^+$ ratio in patients with stage III-IV esophageal cancer. The tablet-plus-CF regimen decreased serum levels of tumor markers [cancer antigen 125 (CA125), CEA and CA19-9], and angiogenesis and metastasis-associated biomarkers [VEGF, transforming growth factor-β1 (TGF-β1), matrix metalloproteinase-9

(MMP-9), and neutrophil gelatinase-associated lipocalin (NGAL)] in these patients [59]. These findings [58, 59] indicate that drugs derived from Caulis Marsdeniae Tenacissimae enhance the anticancer efficacy and reduce the adverse effects of CF regimen, and may boost immune function of the esophageal cancer patients.

Some clinical studies revealed that combining certain CHDs with CF regimen may not enhance the efficacy of CF regimen in treating esophageal cancer, but could alleviate its side effects in patients. For instance, compared to the CF regimen, Fuzheng Guben Decoction (a 13-herb prescription created by a TCM doctor) combined with CF regimen significantly reduced the incidence of vomiting (combined treatment 25% vs. CF regimen 50%), thrombocytopenia (0% vs. 12.5%), and constipation or diarrhea (0% vs. 5.2%) [60]; Xuanfu Daizhe Tang, a classical TCM formula, combined with the CF regimen decreased the occurrence of severe GI reactions (3.3% vs. 30.0%) and serious myelosuppression (6.7% vs. 33.3%) [61]; Ye Ge Yin No.2 (a 10-herb prescription created by a TCM doctor) combined with CF regimen reduced the rates of vomiting (26.7% vs. 46.7%), hepatic and renal function impairment (3.3% vs. 6.7%), and leukopenia (20% vs. 30%) [62].

The CF regimen is also utilized for treating gastric cancer. Bo-Er-Ning Capsule (BENC) in combination with CF regimen significantly prolonged mOS of stage IV gastric cancer patients (BENC + CF regimen vs. CF regimen: 23.57 months vs. 18.75 months) [63]. Higher KPS score and greater body weight gain in the BENC-plus-CF regimen group than in the TC regimen group indicated that the adjuvant therapy with BENC improved the QOL of the patients. The researchers then explored the anticancer mechanisms of BENC using the bioinformatics tool BATMAN-TCM. Enrichment analysis indicated that BENC influenced various cellular processes, including cell proliferation, cell cycle arrest, and apoptosis, which were further validated in gastric cell and/or animal models. The molecular mechanisms underlying BENC's anti-gastric cancer effects and its ability to enhance the efficacy of the CF regimen remain unclear and warrant further investigation.

In patients receiving taxanes plus platinum-based regimens

Platinum-based agents (cisplatin, carboplatin, and oxaliplatin) combined with taxanes (paclitaxel and docetaxel) are commonly used chemotherapies for treating esophageal and gastric cancers.

Shidao Tongjie Formula (a 7-herb prescription created by a TCM doctor) combined with PC regimen (paclitaxel-plus-carboplatin) improved survival in patients with stage IIb-IV esophageal cancer, compared to PC regimen alone (3-year survival rate: 48.6% vs. 25.0%) [64]. This herbal prescription combined with PC regimen increased peripheral NK cells, $CD3^+$ cells and $CD4^+$/$CD8^+$ ratio compared to PC regimen alone, indicating that the herbal prescription improved the immune function of patients receiving PC regimen.

Two reports tested Shidao Tongjie Granule (a PHD with a similar herbal composition to Shidao Tongjie Formula) in combination with TP regimen (docetaxel-plus-cisplatin) for treating stage IIb-IIIc and IIb-IVb esophageal cancer [65, 66]. Patients treated with the combination of the granules and TP regimen had longer median disease-free survival (mDFS) than those treated with TP regimen alone (34.6 months vs. 23.2 months). This combination therapy also improved the ORR of the patients with stage IIb-IVb esophageal cancer (combination therapy vs. TP regimen: 55.00% vs. 32.50%), reduced chemotherapy-related adverse effects, including leukopenia, thrombocytopenia, anemia, and nausea/vomiting, and increased peripheral $CD3^+$ cells, $CD4^+$ cells, $CD4^+$/$CD8^+$ ratio, and NK cells of the patients. These studies suggest that Shidao Tongjie Formula combined with TP regimen and Shidao Tongjie Granule combined with TP regimen can serve as preferential options for treating advanced esophageal cancer.

Esophageal Pingsan, a PHD approved by NMPA as an adjuvant for treating esophageal and gastric cancers, was shown to enhance the anticancer efficacy of TP regimen in patients with stage I-III esophageal cancer (ORR: Esophageal Pingsan + TP regimen 93.33% vs. TP regimen 63.33%) [67]. A lower QLQ-OES18 symptom score was observed in the group receiving the combination treatment than in the group receiving TP regimen monotreatment, indicating that Esophageal Pingsan improved the QOL of the patients.

One report showed that, when compared to TP regimen monotreatment, the combination of Lianqi Capsule (a PHD) with TP regimen not only increased ORR (Lianqi + TP regimen vs. TP regimen: 40% vs. 25%) but also enhanced DCR (75% vs. 53.33%) of stage IV esophageal cancer patients [68]. Patients in the Lianqi Capsule-plus-TP regimen group reported a higher QLQ-C30 function score and KPS score compared to patients in the TP regimen group. However, the incidence of adverse reactions between the two groups was not significantly different.

Yunzhitangtai Capsule, another approved PHD, combined with PC regimen [69] or combined with docetaxel-plus-nedaplatin regimen [70] has been reported to improve ORR and DCR of patients with advanced esophageal cancer. Higher QLQ-C30 and SF-36 (36-Item Short Form Survey) function scores in the two combination groups than in the corresponding chemotherapy group indicate that Yunzhitangtai Capsule improved the QOL of the patients receiving these chemotherapies.

The PHD Tongguanteng Oral Liquid (Solution) in combination with docetaxel-plus-nedaplatin regimen elevated ORR of stage III/IV esophageal cancer patients, compared to the docetaxel-plus-nedaplatin regimen alone (78.13% vs. 53.13%) [71]. The combination of the solution and the docetaxel-plus-nedaplatin regimen also improved KPS score and QLQ-C30 function score, increased peripheral NK cells and NKT cells, and reduced the occurrence rates of myelosuppression, hepatic and renal impairment, and GI disorders. This report further supports the clinical use of PHDs developed from the extracts of Caulis Marsdeniae Tenacissimae as adjuvants to chemotherapies for upper digestive tract cancers.

In addition to PHDs, some herbal prescriptions combined with platinum- and taxane-based chemotherapies, e.g. Jianpi Wenzhong Tang [72], Tongye Tang [73] and Liu Jun Zi Tang [74] respectively combined with cisplatin-plus-docetaxel, and Shenzhu Jiedu Tang [75] and Jianpi Tongluo Decoction [76] respectively combined with TP regimen, enhanced ORR of patients with gastric cancer or esophageal cancer compared to the corresponding mono chemotherapy. These combinations also mitigated chemotherapy-related side effects, i.e. nausea, vomiting, diarrhea, thrombocytopenia, and/or hepatic and renal toxicities. Mechanistic studies indicate that Liu Jun Zi Tang in combination with cisplatin-plus-docetaxel, lowered the serum levels of TGFβ1RI (transforming growth factor β1 type I receptor; related to cell proliferation) and TGFβ1RII, while upregulated the protein level of Smad7 (mothers against decapentaplegic homolog 7, a tumor suppressor) in the esophageal cancer patients, suggesting that the combination exerted anticancer effects potentially by regulating TGFβ1/Smad7 signaling [74].

In patients receiving DCF regimen

DCF regimen, comprising docetaxel, cisplatin, and 5-FU, is a first-line chemotherapy regimen for advanced gastric cancer.

The PHD Bruceae Fructus Oil Oral Liquid in combination with DCF regimen increased the ORR of gastric cancer patients compared to DCF regimen alone (56.3% vs. 38.8%) [77]. More patients in the oral liquid-plus-DCF regimen group showed a >10% increase in KPS score than in the DCF regimen group (56.3% vs. 34.7%), indicating that the PHD improved the QOL of patients receiving DCF regimen. Shenhu Banxia Decoction (a 5-herb prescription created by a TCM doctor) combined with DCF regimen resulted in lower EORTC QLQ-C30 symptom score and higher KPS score compared to the DCF regimen alone [78], indicating that the combination is superior to DCF regimen alone in improving patients' QOL. Shenhu Banxia Decoction increased CR of patients receiving DCF regimen (the decoction + DCF regimen vs. DCF regimen: 53.13% vs. 28.13%) [78].

Xiangsha Liujunzi Tang, a TCM formula, in combination with DCF regimen resulted in higher 1-year, 2-year, and 3-year survival rates compared to DCF regimen alone (1-year: 69.70% vs. 51.52%; 2-year: 48.48% vs. 33.33%; 3-year: 27.27% vs. 12.12%) [79]. The incidence of GI reactions was lower in the combination group than in the DCF regimen group. After treatment with the combination of Xiangsha Liujunzi Tang and DCF regimen, the QLQ-C30 function score of patients was significantly higher than those in the DCF regimen group, indicating that Xiangsha Liujunzi Tang improved the QOL of patients receiving the DCF regimen.

Matrine Injection (main active ingredient: matrine) is a PHD used to treat hepatitis and alleviate leukopenia caused by radiotherapy and chemotherapy. Compared to the DCF regimen alone, the combination of DCF regimen and the injection significantly mitigated myelosuppressive toxicity, reduced nausea, vomiting, hair loss, and hepatic and renal function impairment in the patients, and led to an increase in patient body weight, indicating that Matrine Injection can alleviate the toxicities associated with the DCF regimen [80].

In addition to treating gastric cancer, DCF regimen is also used clinically to treat laryngeal cancer. Two clinical studies tested the efficacy of Pingxiao Capsule, a PHD containing the same herbal components as Pingxiao Tablet, combined with DCF regimen for treating locally advanced laryngeal cancer [81, 82]. Post-treatment outcomes revealed that ORRs were markedly higher in the Pingxiao Capsule-plus-DCF regimen group than in the DCF regimen group (one study: 66.67% vs. 46.15%; the other study: 77.78% vs. 55.56%). Patients receiving the capsule plus DCF regimen had higher WHOQOL-BREF score than those receiving DCF regimen monotreatment, indicating that Pingxiao Capsule improved the QOL of patients receiving DCF regimen treatment. Serum levels of tumor markers [cancer antigen 72-4 (CA72-4), CA19-9, SCC-Ag, CYFRA21-1], and angiogenic and cell invasion factors [soluble tumor necrosis factor receptor I (sTNFRI), VEGF, MMP-9, β2-MG] were lowered, and peripheral $CD4^+$ cells, $CD3^+$ cells, and CD4+/CD8+ ratio were increased in patients receiving the capsule-plus-DCF regimen compared to those patients receiving DCF regimen. These findings demonstrated that Pingxiao Capsule enhanced the treatment outcomes of the DCF regimen in locally advanced laryngeal cancer, and improved QOL and boosted immune function of the patients.

Some chemotherapy regimens/combinations are derived from the DCF regimen, i.e. DOF regimen (docetaxel + oxaliplatin + 5-FU), TEX regimen (docetaxel + capecitabine +

oxaliplatin) and the chemotherapy combination of paclitaxel, oxaliplatin, and 5-FU. Fuzi Lizhong Tang, a TCM formula, in combination with DOF regimen has been shown to decrease peripheral $CD8^+$ cells and increase $CD4^+$/$CD8^+$ ratio, and lower incidence of adverse effects, such as anemia, vomiting/nausea, and thrombocytopenia, in gastric cancer patients compared to DOF regimen alone [83]. The combination of paclitaxel + oxaliplatin + 5-FU and a 15-herb prescription of Yunnan Provincial Hospital of Traditional Chinese Medicine has been shown to reduce the incidence of anorexia (16.28% vs. 48.84%), leukopenia (16.28% vs. 65.12%), and thrombocytopenia (20.93% vs. 67.44%) compared to the chemotherapy alone [84] in patients with gastric cancer. The anticancer PHD Kanglaite Injection in combination with TEX regimen increased the ORR of gastric cancer patients compared to TEX regimen alone (40% vs. 16.7%) [85]. The incidence of adverse events including leukopenia (50% vs. 63.3%), thrombocytopenia (30% vs. 43.3%), diarrhea (33.3% vs. 46.7%) and nausea/vomiting (53.3% vs. 66.7%) was lower in the injection-plus-TEX regimen group than in the TEX regimen group. Kanglaite Injection also improved the QOL of the patients receiving the TEX regimen, evidenced by higher KPS score in the combination group than in the TEX regimen group.

In patients receiving FOLFOX regimen

FOLFOX regimen, a chemotherapy combination that comprises 5-FU, leucovorin, and oxaliplatin, is widely used for treating cancer. Based on the differences in drug dosage and administration methods, the FOLFOX regimen can be divided into FOLFOX4, FOLFOX6, and mFOLFOX6 regimens. Twenty-six research articles have reported the therapeutic effects of the FOLFOX regimen in combination with 26 CHDs for the treatment of gastric cancer.

Thirteen CHDs improved the efficacy and reduced the adverse effects of FOLFOX regimen. Cidan Capsule, an NMPA-approved PHD, prolonged the mOS of patients treated with FOLFOX regimen (9.2 months vs. 8 months) [86]. Jianpi Hewei Ke'ai Tang [87] and Jianwei Sanjie Prescription [88], two multi-herb prescriptions created by TCM doctors, prolonged PFS of patients treated with FOLFOX regimen. Four multi-herb prescriptions created by TCM doctors (i.e. Shengxue Tang [89], Huazhuo Hewei Sanjie Tang [90], Wenyang Huazheng Tang [91] and Xinye County Hospital of Traditional Chinese Medicine-prepared Decoction [92]) and a combination of NMPA-approved PHDs (Huangqi Injection + Danshen Injection [93]) have been shown to prolong the OS of patients receiving FOLFOX regimen. FOLFOX regimen in combination with each of the eight multi-herb prescriptions created by TCM doctors, i.e. Shengxue Tang (64.4% vs. 51.2%) [89], Xiangsha Liujunzi Tang (48% vs. 57%) [94], Jianpi Huayu Tang (86.66% vs. 63.33%) [95], Buxu Jiedu Tang (89.4% vs. 72.3%) [96], Jianpi Yangwei Tang (51.19% vs. 35.71%) [97], Mianyang Hospital of Traditional Chinese Medicine-prepared Jianpi Huayu Tang (56.25% vs. 41.67%) [98], the PHD Cidan Capsule (65.6% vs. 52.9%) [86], or the PHD combination Huangqi Injection plus Danshen Injection (61.54% vs. 36.38%) [93], achieved significantly higher ORR than the FOLFOX regimen alone. FOLFOX regimen in combination with Huazhuo Hewei Sanjie Tang achieved significantly higher DCR than FOLFOX regimen alone (72.22% vs. 46.67%) [90]. All thirteen CHDs mentioned above can reduce the incidence of adverse effects caused by FOLFOX regimen, including GI reactions, myelosuppression, liver and kidney injury, and leukopenia.

Among the 13 CHDs, six (Jianpi Hewei Ke'ai Tang, Xiangsha Liujunzi Tang, Jianpi Huayu Tang, Jianwei Sanjie Prescription, Buxu Jiedu Tang and Mianyang Hospital of Traditional Chinese Medicine-prepared Jianpi Huayu Tang) improved the QOL of patients undergoing FOLFOX regimen. In addition, FOLFOX regimen in combination with Huangqi Injection + Danshen Injection was able to effectively down-regulate the serum levels of VEGF and CEA [93]; and in combination with Jianwei Sanjie Prescription had better effects in down-regulating serum levels of the tumor markers CA19-9, CA72-4, and CEA compared to FOLFOX regimen alone [88].

Two TCM prescriptions (Fuzheng Xiaozheng Tang and Modified Xuezheng Decoction) improved the efficacy of FOLFOX regimen without relieving the adverse effects induced by the FOLFOX regimen. Fuzheng Xiaozheng Tang in combination with FOLFOX regimen achieved higher ORR than single chemotherapy (24% vs. 13%) [99, 100]. Modified Xuezheng Decoction in combination with FOLFOX regimen, achieved significantly higher ORR than single chemotherapy (57.69% vs. 36.54%) [101]. The QLQ-C30 function score was higher in the Fuzheng Xiaozheng Tang-plus-FOLFOX regimen group than in the FOLFOX regimen group, indicating that it enhanced the QOL of patients receiving FOLFOX regimen [99, 100].

Five CHDs improved immune function of patients receiving FOLFOX regimen. Elemene Injection increased $CD3^+$, $CD4^+$ T cells and $CD4^+$/$CD8^+$ ratio [102]; Huayu Jianpi Tang [103] and Mianyang Hospital of Traditional Chinese Medicine-prepared Jianpi Huayu Tang increased $CD3^+$ and $CD4^+$ T cells [98]; Shiyiwei Shenqi Tang increased $CD4^+$/$CD8^+$ ratio [104] in patients receiving FOLFOX regimen. One of the five CHDs (Shiyiwei Shenqi Tang), in combination with FOLFOX regimen, achieved significantly higher ORR than single FOLFOX regimen (94.12% vs. 67.65%) [104]. Combined FOLFOX regimen with Elemene Injection or Modified Shenling

Baizhu Tang reduced the occurrence rate of chemotherapy-induced adverse effects (erythropenia, leukopenia and thrombocytopenia for Elemene Injection; GI reactions for Modified Shenling Baizhu Tang). Meanwhile, co-treatment with FOLFOX regimen and Elemene Injection, Huayu Jianpi Tang or Modified Shenling Baizhu Tang significantly enhanced patients' QOL. Moreover, one of the five CHDs, Huayu Jianpi Tang, has been shown to down-regulate serum levels of tumor marker: CEA, CA19-9, and CA125, in patients receiving FOLFOX regimen [103].

Six TCM prescriptions (Fuzheng Jianpi Tang + Jianpi Hewei Tang [106], Jianpi Bushen Yiqi Yangxue Prescription [107], Liujunzi + Tengligen Tang [108], Qingdao Tumor Hospital-prepared Decoction [109], Weifu Tang [110], and Zibo Hospital of Traditional Chinese Medicine-prepared Prescription [111]) markedly improved the QOL of gastric cancer patients undergoing the FOLFOX regimen. Meanwhile, four of them (i.e. Fuzheng Jianpi Tang + Jianpi Hewei Tang, Liujunzi + Tengligen Tang, Weifu Tang, and Zibo Hospital of Traditional Chinese Medicine-prepared Prescription) reduced the incidence of adverse effects caused by chemotherapy (e.g. GI reactions, myelosuppression, leukopenia, weak and neurotoxicity). Zibo Hospital of Traditional Chinese Medicine-prepared Prescription down-regulated serum levels of the tumor markers CEA, CA19-9, and pepsinogen I (PGI) in gastric cancer patients receiving chemotherapy [111].

A research article has reported the effects of Modified Shenling Baizhu Tang in regulating gut microbiota and improving intestinal barrier function. FOLFOX regimen in combination with this CHD exhibited better effects in down-regulating serum levels of intestinal barrier markers (Diamine oxidase, D-lactate, and endotoxin) compared to mono chemotherapy. This CHD in combination with FOLFOX regimen also increased the numbers of *Lactobacillus* and *Bifidobacterium*, as well as reduced the numbers of *Enterococcus*, *Staphylococcus* and *Peptostreptococcus* in faeces of patients compared to FOLFOX regimen alone [105].

In patients receiving SOX regimen

SOX regimen, a chemotherapy combination comprising S-1 and oxaliplatin, is widely used for treating cancers, especially gastric cancer. Recently, 18 research articles have reported the effects of combining each of the 17 CHDs with a SOX regimen in treating gastric cancer.

Thirteen CHDs improved the efficacy of the SOX regimen. Huosu Yangwei Oral Liquid, an NMPA-approved PHD, prolonged mOS of patients receiving SOX regimen (combined treatment 8.8 months vs. SOX regimen treatment 7.4 months) [112, 113]. Putuo Hospital Affiliated to Shanghai University of Traditional Chinese Medicine-prepared Jianpi Jiedu Tang, a 7-herb prescription, combined with SOX regimen, resulted in a higher 1-year survival rate compared to SOX regimen alone (32.3% vs. 9.6%) [114]. Two NMPA-approved PHDs, i.e. Aidi Injection (DCR: 87% vs. 67%, 93.75% vs. 68.65%; ORR: 57% vs. 27%, 68.75% vs. 40.63%) [115, 116] and Huosu Yangwei Oral Liquid (DCR: 60.6% vs. 40.8%; ORR: 64.71% vs. 14.29%) [112, 113], and the multi-herb prescription Kuerle Hospital-prepared Decoction (DCR: 84.32% vs. 73.88%; ORR: 61.16% vs. 47.76%) [117], combined with SOX regimen achieved higher DCR and ORR in treating gastric cancer compared to chemotherapy alone. Buzhong Xiaowei Decoction (88.89% vs. 70.37% [118]), Chanpi Ezhu Tang (77.50% vs. 51.28%) [119], and Guangshan County People's Hospital-prepared Shenyi Jianzhong Tang (88.89% vs. 68.89%) [120], three multi-herb prescriptions created by TCM doctors, combined with SOX regimen achieved higher DCR in treating gastric cancer than chemotherapy alone. Modified Bazhen Tang (45.1% vs. 25.49%) [121], Fuzheng Xiaoliu Tang (83.72% vs. 65.12%) [122], The First Affiliated Hospital of China Medical University-prepared Shenyi Jianzhong Tang (90.7% vs. 69.77%) [123], Jiawei Xiaoxianxiong Tang (83.72% vs. 65.12%) [124], Zisheng Xiexin Tang (86.7% vs. 56.7%) [125], and The Second Hospital of Jiaxing-prepared Decoction (64.7% vs. 45.1%) [126], six multi-herb prescriptions created by TCM doctors, combined with SOX regimen attained higher ORR in treating gastric cancer compared to chemotherapy alone.

Seven of the 13 mentioned CHDs (i.e. Aidi Injection, Chanpi Ezhu Tang, Huosu Yangwei Oral Liquid, Jiawei Xiaoxianxiong Tang, Kuerle Hospital-prepared Decoction, The Second Hospital of Jiaxing-prepared Decoction and Putuo Hospital Affiliated to Shanghai University of Traditional Chinese Medicine-prepared Jianpi Jiedu Tang) decreased the incidence of adverse effects caused by the SOX regimen, including GI reactions, liver and kidney injury, leukopenia and myelosuppression. Meanwhile, six of the 13 mentioned CHDs (Buzhong Xiaowei Tang, Guangshan County People's Hospital-prepared Shenyi Jianzhong Tang, Huosu Yangwei Oral Liquid, Putuo Hospital Affiliated to Shanghai University of Traditional Chinese Medicine-prepared Jianpi Jiedu Tang, The Second Hospital of Jiaxing-prepared Decoction, and The First Affiliated Hospital of China Medical University-prepared Shenyi Jianzhong Tang) significantly enhanced the QOL of patients receiving the SOX regimen.

One NMPA-approved PHD (Kanglaite Injection [127]) and two multi-herb prescriptions created by TCM doctors (Gansu Provincial Cancer Hospital-prepared Jianpi Huayu Tang [128] and Shanxi Hospital of Traditional Chinese Medicine-prepared Jianpi Quyu Tang [129])

markedly improved the QOL of gastric cancer patients undergoing the SOX regimen. These three CHDs also protected gastric cancer patients from SOX regimen-induced adverse effects.

Seven of the 17 CHDs described in this section, including Aidi Injection (CEA, CA125, CA199, and CA242) [115, 116], Modified Bazhen Tang [CEA, CA19-9, insulin-like growth factor 1 (IGF-1) and platelet endothelial cell adhesion molecule (PECAM-1)] [121], Chanpi Ezhu Tang (CA19-9) [119], Kanglaite Injection (CEA and CA19-9) [127], Kuerle Hospital-prepared Decoction (CEA, CA19-9, CA125, CA242, and VEGF) [117], Sanleng Ezhu Decoction (CA125, CA72-4, CEA, and VEGF) [130], and The Second Hospital of Jiaxing-prepared Decoction (VEGF, TIMP1, and MMP-9) [126], in combination with SOX regimen respectively exerted better effects in down-regulating serum levels of tumor markers than SOX regimen alone.

Among the 17 CHDs described in this section, six CHDs improved the immune function of patients receiving SOX regimen. Modified Bazhen Tang [121], Fuzheng Xiaoliu Tang [122], Guangshan County People's Hospital-prepared Shenyi Jianzhong Tang [120], The Second Hospital of Jiaxing-prepared Decoction [126], and Sanleng Ezhu Decoction [130] markedly increased $CD3^+$ and $CD4^+$ T cells, and $CD4^+/CD8^+$ ratio in patients receiving SOX regimen. Putuo Hospital Affiliated to Shanghai University of Traditional Chinese Medicine-prepared Jianpi Jiedu Tang significantly increased NK cells in patients receiving SOX regimen [114].

In patients receiving XELOX regimen

XELOX regimen, a chemotherapy combination comprising capecitabine and oxaliplatin, is widely used for treating cancers, especially colorectal cancer. Fifteen research articles have reported the combinational use of the individual 15 CHDs with XELOX regimen in treating gastric cancer or esophageal cancer.

Ten CHDs improved the efficacy of the XELOX regimen. In gastric cancer patients, Bruceae Fructus Oil Injection combined with XELOX regimen resulted in higher 1-year and 2-year survival rates compared to XELOX regimen alone (1-year survival rate: 75% vs. 59.4%; 2-year survival rate: 21.9% vs. 15.6%) [131]. Shenzhu Jianyun Tiaoqi Tang, a 15-herb prescription created by a TCM doctor, increased the 1-year survival rate of esophageal cancer patients receiving XELOX regimen (59.09% vs. 34.09%) [132]. Yiqi Jiedu Tang (an 11-herb prescription created by a TCM doctor) combined with XELOX regimen achieved higher DCR and ORR in treating gastric cancer compared to chemotherapy alone (DCR: 93.88% vs. 79.59%; ORR: 65.31% vs. 42.68%) [133]. Fuzheng Huayu Tang (a 13-herb prescription created by a TCM doctor) combined with XELOX regimen achieved higher ORR in treating gastric cancer compared to chemotherapy alone (83.3% vs. 60%) [134]. Two PHDs, i.e. Astragalus Polysaccharide Injection (85.71% vs. 59.52%) [135] and Bruceae Fructus Oil Injection (68.7% vs. 53.1%) [131], and four multi-herb prescriptions created by TCM doctors, i.e. Jianpi Guben Huadu Tang (77.5% vs. 55%) [136], Buzhong Yiqi Tang (97.5% vs. 87.5%) [137], Jianpi Quyu Tang (97.5% vs. 87.5%) [138] and Jianpi Yishen Tang (85% vs. 52.5%), [139] combined with the XELOX regimen accomplished higher ORR in the treating gastric cancer compared to chemotherapy alone. A PHD, i.e. Huachansu Capsule (61.76% vs. 50%) [140], and a 15-herb prescription created by a TCM doctor, i.e. Shenzhu Jianyun Tiaoqi Tang (27.27% vs. 18.18%) [132], combined with XELOX regimen achieved higher ORR in treating esophageal cancer compared to chemotherapy alone.

Five of the ten CHDs mentioned above (i.e. Astragalus Polysaccharide Injection, Bruceae Fructus Oil Injection, Fuzheng Huayu Tang, Huachansu Capsule, and Jianpi Guben Huadu Tang) reduced the incidence of adverse effects caused by the XELOX regimen, including GI reactions, liver and kidney injury, leukopenia, myelosuppression and fragility. Five of the ten CHDs mentioned above (Bruceae Fructus Oil Injection, Buzhong Yiqi Tang, Huachansu Capsule, Jianpi Guben Huadu Tang, and Jianpi Yishen Tang) significantly enhanced the QOL of patients receiving the XELOX regimen.

Three multi-herb prescriptions created by TCM doctors (Qizhu Fuzheng Tang [141], Shenling Baizhu Tang [142], and The Second People's Hospital of Luxian County-prepared Decoction [143]) did not affect the efficacy of the XELOX regimen, however, the QOL of gastric cancer patients undergoing the XELOX regimen was significantly improved. Three multi-herb prescriptions created by TCM doctors (Huangqi Jianzhong Tang [144], Jianpi Yangxue Tang [145] and Shenling Baizhu Tang [142]) protected gastric cancer patients against adverse effects caused by the XELOX regimen.

Among the 15 CHDs mentioned in this section, three CHDs improved the immune function of gastric cancer patients receiving the XELOX regimen. Fuzheng Huayu Tang significantly increased $CD4^+$ T cells, decreased $CD8^+$ T cells, and increased $CD4^+/CD8^+$ ratio in patients receiving the XELOX regimen [141]. Jianpi Yishen Tang [145], and Yiqi Jiedu Tang [133] significantly increased $CD3^+$, $CD4^+$ T cells, and decreased $CD8^+$ T cells in patients receiving the XELOX regimen.

Six of the 15 CHDs described in this paragraph, including Buzhong Yiqi Tang (CA199, CA724, CEA, and TPS) [137], Jianpi Guben Huadu Tang (CEA and CA19-9) [136], Jianpi Yangxue Tang (CEA and CA19-9) [145], Qizhu Fuzheng Tang (CEA, CA19-9, and CA72-4) [141],

Shenzhu Jianyun Tiaoqi Tang (VEGF and CYFRA21-1) [132], and Yiqi Jiedu Tang (CEA, CA19-9, CA72-4, and CA125) [133], in combination with the XELOX regimen respectively demonstrated better effects in down-regulating serum levels of tumor markers than the XELOX regimen alone.

Astragalus Polysaccharide Injection in combination with XELOX regimen exhibited better effects in up-regulating the serum level of interferon-γ (IFN-γ) and down-regulating the serum level of interleukin 4 (IL-4) than the XELOX regimen alone [135]. These findings indicated that this injection in combination with the XELOX regimen had stronger anti-inflammatory effects than mono-chemotherapy in patients with gastric cancer.

In patients receiving FAM regimen

The combination of 5-FU, doxorubicin, and mitomycin (known as FAM regimen) has been used for treating gastric cancer since the 1980s [199]. Four research articles reported the combinational use of each of the four CHDs with the FAM regimen in treating gastric cancer.

Compound Danshen Dripping Pill is a PHD comprising extracts of Salviae Miltiorrhizae Radix et Rhizoma, Notoginseng Radix et Rhizoma, and Borneolum Syntheticum. It has been demonstrated that combining this drug with the FAM regimen significantly improved DCR in patients with gastric cancer (67.4% vs. 43.2%). Patients in the FAM regimen + Compound Danshen Dripping Pill treatment group had higher KPS score and greater body weight gain compared to patients in the FAM regimen group, indicating that this herbal drug improved the QOL of patients undergoing the FAM regimen. This herbal drug also decreased the occurrence rates of leukopenia and nausea/vomiting caused by chemotherapy in the gastric cancer patients [146].

Shenqi Fuzheng Injection plus FAM regimen resulted in higher ORR compared to FAM regimen alone (58.33% vs. 33.33%). Meanwhile, the incidence of adverse effects (leukopenia, nausea/vomiting, weakness and insomnia, and thrombocytopenia) in patients receiving the combined treatment was lower compared to patients receiving the FAM regimen alone [147].

Weining Granule is prepared based on a 4-herb prescription created by a TCM doctor. In a clinical trial assessing the efficacy of Weining Granule + FAM regimen in treating gastric cancer, 180 patients with stage II/III gastric cancer were randomly assigned to receive Weining Granule + FAM regimen or FAM regimen alone. After a 6-month treatment, the combined therapy showed significantly better effects in lowering serum levels of the tumor markers VEGF and MMP-9. In the combined therapy arm, 6 patients had recurrence, and 14 patients experienced metastasis within one year, which is significantly less than that observed in the FAM regimen arm where 10 patients experienced recurrence and 19 experienced metastasis [148].

Xiangsha Yangwei Wan in combination with the FAM regimen significantly increased the 1-year survival rate of advanced gastric cancer patients compared to the FAM regimen alone (38.7% vs. 6.4%) [149].

In patients receiving ECF regimen

ECF regimen is the chemotherapy combination of 5-FU, cisplatin, and epirubicin. In stage IIIB/IV gastric cancer patients, ECF regimen plus Fufang Kushen Injection significantly increased 0.5-, 1-, 2-year survival rates compared to the ECF regimen alone (0.5-year survival rate: 87.5% vs. 65.6%; 1-year survival rate: 75.0% vs. 59.4%; 2-year survival rate: 40.6% vs. 21.9%). Patients receiving combined therapy had a higher KPS score than those receiving chemotherapy alone, indicating that Fufang Kushen Injection improved the QOL of the patients. In addition, Fufang Kushen Injection ameliorated chemotherapy-induced adverse effects including leukopenia and liver injury in the patients [150]. In another study designed to assess the efficacy and safety of Fufang Kushen Injection in combination with the ECF regimen in advanced gastric cancer patients, the combined treatment exhibited higher ORR than chemotherapy alone (65% vs. 37.5%). Fufang Kushen Injection co-treatment reduced the incidence of chemotherapy-induced adverse effects, including leukopenia and erythrocytopenia [151]. These studies demonstrate that Fufang Kushen Injection improves the effectiveness and reduces the adverse effects of the ECF regimen in treating patients with gastric cancer, while also enhancing the QOL of the patients.

In patients receiving other regimens

Apart from the regimens mentioned above, there are also other combinations of different chemotherapy drugs. In this section, we describe the effects of combining each of the 12 CHDs with various multi-drug chemotherapy for the treatment of gastric and esophageal cancers.

For treating esophageal cancer, Xianchan Tablet, a PHD used as an adjuvant for cancer therapies, combined with a multi-drug chemotherapy (cisplatin + leucovorin + paclitaxel) resulted in a higher DCR (91.2% vs. 70.6%) than single chemotherapy. This PHD also improved the immune function and QOL of patients receiving the chemotherapy [152]. Shenyi Capsule, another adjuvant anti-cancer PHD, combined with chemotherapy (cisplatin + gemcitabine) resulted in a higher 1-year survival rate (66.7% vs. 36.7%) and lower serum levels of the tumor marker VEGF in esophageal cancer patients compared to chemotherapy alone. Meanwhile, this PHD protected patients against chemotherapy-induced adverse

effects (GI reactions, thrombocytopenia, and myelosuppression) and improved the QOL of the patients [153].

An article reported that combined use of 5-FU, bleomycin, cisplatin and Compound Danshen Dripping Pill resulted in a significantly higher DCR than single chemotherapy in esophageal cancer patients (80.6% vs. 52.9%). A higher KPS score was observed in patients of the combined treatment group, indicating that Compound Danshen Dripping Pill improved the QOL of patients undergoing the chemotherapy. In addition, the incidence of adverse effects (leukopenia and nausea/vomiting) was lower in patients receiving the combined treatment than those receiving chemotherapy alone [154].

5-FU + hydroxycamptothecin + cisplatin combined with Huohua Kaitong Capsule, prepared based on a 12-herb prescription created by a TCM doctor, achieved significantly higher 1-, 2-, and 3-year survival rates and longer mOS in patients with stage III/IV esophageal cancer compared to chemotherapy alone (1-year survival rate: 78.3% vs. 53.7%; 2-year survival rate: 63.2% vs. 33.3%; 3-year survival rate: 39.6% vs 16.7%; mOS: 19 months vs. 9.5 months). A higher KPS score was observed in patients of the combined treatment group, indicating that this herbal drug improved the QOL of patients undergoing the chemotherapy. In addition, Huohua Kaitong Capsule co-treatment reduced the incidence of chemotherapy-induced adverse effects, including leukopenia, nausea/vomiting, and thrombocytopenia [155].

For the treatment of gastric cancer, Fuzi Lizhong Tang, a classical TCM formula, in combination with cisplatin-plus-vinorelbine increased ORR (combined treatment 58.71% vs. chemotherapy 59.52%), and down-regulated serum levels of tumor markers [Pentraxin-3, CYFRA21-1, thyroid transcription factor-1 (TTF-1) and human epididymis protein 4 (HE4)] in patients compared to the chemotherapy alone. In addition, Fuzi Lizhong Tang reduced the incidence of adverse effects caused by the chemotherapy from 52.38% to 23.81% [156].

Jianpi Jiedu Decoction prepared by Jiangsu Province Hospital of Traditional Chinese Medicine is a 12-herb prescription. In gastric cancer patients, this prescription combined with a chemotherapy (5-FU + cisplatin + epirubicin + leucovorin) significantly increased ORR and DCR compared to chemotherapy alone (ORR: 55% vs. 47.5%, CDR: 75% vs. 62.5%). It also increased $CD3^+$ cells, $CD4^+$ cells, and NK cells, and elevated $CD4^+/CD8^+$ ratio, in patients receiving the chemotherapy, indicating that it enhanced the immune function of the patients. This prescription also lowered the occurrence rate of chemotherapy-induced adverse effects [157].

Fuzheng Yiai Tang, a 9-herb prescription created by a TCM doctor, increased the ORR (53.1% vs. 46.7%) of paclitaxelin in patients with gastric cancer. In addition, this prescription reduced paclitaxelin-induced adverse effects and improved the QOL of the patients [158].

Guishao Liujun Tang, a 14-herb prescription created by a TCM doctor, combined with paclitaxel-plus-S-1 resulted in a significant increment in ORR in patients with advanced gastric cancer compared to the chemotherapy alone (98% vs. 70%). Moreover, a higher KPS score was observed in the combined treatment group than in the paclitaxel-plus-S-1 therapy group, indicating that this prescription improved QOL of patients receiving the chemotherapy [159].

Modified Xiangsha Liujunzi Decoction is an 11-herb prescription of a TCM doctor. It enhanced QOL of gastric cancer patients undergoing a chemotherapy (cisplatin + paclitaxel + leucovorin). Meanwhile, this prescription significantly reduced the chemotherapy-induced adverse effects including GI reactions, leukopenia, thrombocytopenia, liver injury, alopecia, anemia, and stomatitis in the patients [160].

Two reports studied 2 PHDs in gastric cancer patients receiving 5-FU + cisplatin + leucovorin. Bruceae Fructus Oil Injection enhanced immune function of gastric cancer patients receiving chemotherapy, evidenced by more $CD3^+$ and $CD4^+$ T cells, and fewer $CD8^+$ T cells in the combined treatment group than in the mono chemotherapy group [161]. Fufang Kushen Injection in combination with 5-FU + cisplatin + leucovorin achieved significantly higher DCR than single chemotherapy in treating gastric cancer (81.3% vs. 70.8%). Patients receiving combined therapy had a higher KPS score than those receiving single chemotherapy, indicating that this PHD improved the QOL of the patients. Meanwhile, the incidence of adverse effects (myelosuppression and GI adverse reactions) in patients receiving the combined treatment was lower than that observed in patients receiving chemotherapy alone. Higher $CD4^+$ T cells, $CD3^+$ T cells and $CD4^+/CD8^+$ ratio, as well as lower $CD8^+$ cells, were observed in the combined treatment group than in the mono chemotherapy group [162].

A 12-herb prescription created by a TCM doctor combined with 5-FU + etoposide + leucovorin resulted in significantly longer mOS in gastric cancer patients compared to single chemotherapy (25.6 months vs. 17.3 months). The QOL of patients receiving the combined treatment was better than that of patients receiving chemotherapy alone [163]. A 14-herb prescription created by a TCM doctor combined with 5-FU + etoposide + leucovorin increased the ORR of gastric cancer patients compared to chemotherapy alone (94% vs. 85.3%) [164].

In patients receiving chemoradiotherapy

Ten eligible reports studied six CHDs in patients receiving chemoradiotherapy. Five CHDs were tested in

esophageal cancer patients; one was tested in gastric cancer patients.

Bazhen Tang, a classical TCM formula, increased the ORR of II-IV-stage esophageal cancer patients receiving paclitaxel-plus-radiotherapy. This formula enhanced the immune function of the patients ($CD4^+$ T cells and $CD4^+/CD8^+$ ratio increased; $CD8^+$ T cells decreased), and improved patients' QOL (KPS score increased; QLQ-C30 symptom score decreased) [165, 166]. In addition, this formula ameliorated chemoradiotherapy-induced adverse effects including radiation esophagitis, radiation pneumonitis, myelosuppression, liver injury, and kidney injury [165, 166]. When combined with the CF regimen and radiotherapy, this formula increased the ORR of chemoradiotherapy in esophageal cancer patients from 37.8% to 67.6% [167]. Moreover, Bazhen Tang increased $CD4^+$ T and NK cells, decreased $CD8^+$ T cells, and enhanced the QOL of esophageal cancer patients receiving the chemoradiotherapy [167].

Shenmai Injection is a PHD prepared with Ginseng Radix et Rhizoma Rubra and Ophiopogonis Radix. It is commonly used as an adjuvant drug for treating cancer in China. In late-stage esophageal cancer patients, Shenmai Injection combined with chemoradiotherapy (CF regimen + radiotherapy) significantly increased ORR compared to chemoradiotherapy alone [168, 169]. It also significantly reduced the occurrence rates of chemoradiotherapy-induced leukemoid reaction and GI adverse reactions in the patients. Another report showed that Shenmai Injection significantly improved ORR in advanced ESCC patients treated with chemoradiotherapy (capecitabine + radiotherapy) (83.33% vs. 76.67%). Meanwhile, Shenmai Injection elevated KPS score in these patients, indicating an improvement in patients' QOL. It also decreased the occurrence rates of leukopenia, GI adverse reactions, radiation esophagitis, and radiation pneumonitis caused by chemoradiotherapy, in ESCC patients [170].

Shenqi Fuzheng Injection, a PHD used as an adjuvant to cancer therapies, reduced the toxicities of chemoradiotherapy (CF regimen + radiotherapy) in esophageal cancer patients [171]. Patients in the combined treatment group had a lower probability of suffering from severe radiation esophagitis, granulocytopenia, nausea, and vomiting compared to patients in the mono-chemoradiotherapy treatment group [171].

Huachansu Capsule combined with chemoradiotherapy (CF regimen + radiotherapy) resulted in a longer mOS (15 months vs. 12 months) and a higher ORR (75% vs. 62.5%) in esophageal cancer patients compared to chemoradiotherapy alone. Meanwhile, the incidence of adverse reactions induced by chemoradiotherapy (leukopenia, esophagitis, nausea, and myalgia) was lower in the combined therapy group than in the chemoradiotherapy group [172].

Xiao'aiping Injection is another adjuvant anti-cancer PHD. It was prepared from the TCM herb Marsdeniae Tenacissimae Caulis. The drug improved the clinical efficacy of chemoradiotherapy (mFOLFOX6 regimen + radiotherapy) in esophageal cancer patients, evidenced by an elevated DCR (43.3% vs. 33.3%). Patients receiving combined therapy had a higher KPS score than patients receiving chemoradiotherapy, indicating that the injection improved patients' QOL. In addition, the occurrence rates of chemoradiotherapy-induced GI adverse reactions and leukopenia in the patients were markedly reduced by the addition of Xiao'aiping Injection treatment [173].

Huaier Keli is an NMPA-approved drug developed from *Trametes robiniophila*. In the treatment of gastric cancer, patients receiving Huaier Keli plus chemoradiotherapy (capecitabine + radiotherapy) had better QOL (lower symptom score, higher function score of QLQ-C30) than those receiving chemoradiotherapy alone. In addition, Huaier Keli enhanced the immune function of gastric cancer patients receiving chemoradiotherapy. Higher WBC count, $CD4^+$ T cells, NK cells and $CD4^+/CD8^+$ ratio, as well as lower $CD8^+$ cells were observed in the combined therapy group than in the chemoradiotherapy group [174].

In patients receiving targeted therapy

There are six eligible reports regarding the benefits of five CHDs in gastric cancer patients receiving targeted therapies.

Kanglaite Injection in combination with apatinib prolonged the PFS of gastric cancer patients compared to apatinib alone (median PFS: 11.4 months vs. 6.2 months). The TRR of patients was significantly higher in the combined treatment group than in apatinib group (86.67% vs. 66.67%). Kanglaite Injection decreased the incidence of apatinib-induced adverse effects, including leukocyte reduction, liver injury and anemia; and elevated the KPS score of patients receiving apatinib. These findings indicated that Kanglaite Injection improved the QOL of these patients. In addition, the upregulation of serum inflammatory cytokines (IL-2, TNF-α and INF-γ) induced by the targeted therapy was significantly diminished by Kanglaite Injection [175, 176].

Huosu Yangwei Oral Liquid is a PHD that has been demonstrated to ameliorate apatinib-induced adverse effects. Co-treatment with Huosu Yangwei Oral Liquid significantly reduced the incidence of apatinib-induced adverse effects from 90.0% to 66.7%. Huosu Yangwei Oral Liquid also improved the QOL of patients receiving apatinib treatment. The KPS score was higher in

the combined treatment group than in the apatinib mono-treatment group [177].

Buzhong Xiaowei Decoction, an 11-herb prescription created by a TCM doctor, combined with apatinib-plus-S-1 therapy achieved significantly higher DCR in the treatment of stage III-IV gastric cancer compared to apatinib-plus-S-1 therapy (91.55% vs. 70.42%). The immune function of patients in the combined treatment group was better than that of the apatinib-plus-S-1 therapy group. The decoction markedly increased $CD3^+$ and $CD4^+$ T cells, and decreased $CD8^+$ T cells in patients receiving apatinib-plus-S-1 therapy. In addition, the incidence of adverse reactions (dizziness, weakness, nausea, vomiting, and stomachache) caused by apatinib-plus-S-1 therapy was significantly decreased by the decoction [178].

Guben Xiaoai Decoction is a 23-herb prescription created by a TCM doctor. It also enhanced the efficacy and reduced the toxicities of apatinib-plus-S-1 therapy. This decoction increased the DCR of gastric cancer patients undergoing apatinib-plus-S-1therapy by 11.43% (82.86% vs. 71.43%). The combined therapy more effectively down-regulated serum levels of three tumor markers: CEA, CA125, and CA19-9, compared to apatinib-plus-S-1 therapy alone. This decoction enhanced the immune function of patients receiving apatinib-plus-S-1 therapy, evidenced by higher $CD3^+$, $CD4^+$ T cell counts, and $CD4^+/CD8^+$ ratio, and lower $CD8^+$ T cell count in the combined treatment group than in apatinib-plus-S-1 therapy group. Moreover, a higher KPS score and a lower incidence of adverse effects (myelosuppression, GI adverse reactions, liver and kidney injury) were observed in the combined treatment group than in apatinib-plus-S-1 therapy group [179].

Combining Yiyang Jianpi Formula (a 12-herb prescription created by a TCM doctor) with apatinib-plus-S-1 therapy resulted in a significant increment in the DCR of patients with advanced gastric cancer (82.86% vs. 65.71%). The combined therapy was more effective in lowering serum levels of the tumor markers CEA and CA125 compared to apatinib-plus-S-1 therapy alone. Meanwhile, this formula decreased the occurrence rates of adverse effects (nausea, vomiting, myelosuppression, hepatotoxicity) induced by apatinib-plus-S-1 therapy [180].

In patients with precancerous lesions

Across 14 eligible reports, the clinical efficacy of 12 CHDs was evaluated. One CHD was tested in patients with oral leukoplakia, one in patients with laryngeal precancerous lesions, one in patients with oral leukoplakia and patients with esophageal epithelial hyperplasia, and nine in patients with gastric precancerous lesions.

A seven-herb prescription created by a TCM doctor combined with Transfer Factor Capsule-plus-local Vitamin A and D Drop increased the DCR of patients with oral leukoplakia compared to Transfer Factor Capsule-plus-Vitamin A and D Drop alone (91.67% vs. 72.92%). After a 30-day treatment, patients treated with combination therapy had a higher serum IgG level and lower serum IgA and IgM levels compared to patients treated with Western medicine only. Among the 48 patients in the Western medicine group, three experienced mild nausea and vomiting, and one experienced mild headache. Only one of the 48 patients in the combined therapy group experienced mild nausea and vomiting [181].

Modified Sanjiasan (a prescription created by a TCM doctor) combined with local recombinant human P53 adenovirus resulted in a significantly higher ORR in patients with laryngeal precancerous lesions compared to single adenovirus treatment (85.71% vs. 66.67%). After a 6-week treatment, the combination treatment showed significantly better effects in lowering serum levels of the tumor markers VEGF and β_2-microglobulin (β_2-MG) compared to the adenovirus treatment alone. Moreover, the prescription enhanced the immune function of patients, evidenced by a higher number of $CD4^+$ T cells and lower number of $CD8^+$ T cells in the combined treatment group than in the mono adenovirus treatment group [182].

Zengshengping (also called Antitumor B) is a PHD for treating esophageal and cardiac epithelial hyperplasia. A clinical study assessed the efficacy of a 6-month Zengshengping treatment in severe esophageal dysplasia. Compared to the placebo group, a significantly higher proportion of patients from the Zengshengping group reported the disappearance or alleviation of symptoms such as dry mouth, dry throat, acid reflux, and bloating (disappearance of symptoms: 34.3% vs. 4.7%; alleviation of symptoms: 51.3% vs. 8.1%). The results from endoscopy and histopathology of the esophagus showed that patients treated with Zengshengping had a significantly higher reversal of dysplasia rates compared to the placebo group (endoscopy: 59% vs. 38.7%; histopathology: 64.3% vs. 22.8%). Of 300 patients who received Zengshengping treatment, seven experienced temporary adverse effects. Five patients experienced increased bowel movements and two patients experienced nausea and rashes. All adverse effects resolved after the medication was stopped [183]. In a 5-year study, the efficacy of Zengshengping in preventing the progression of severe esophageal dysplasia to esophageal cancer was assessed. A total of 2,523 patients were randomly assigned to

receive Zengshengping, retinamide (an apoptosis-inducing agent), or placebo treatment. Four hundred seventy-nine persons in the Zengshengping group, 506 persons in the retinamide group, 507 persons in the placebo group completed the 5-year study. Results of esophageal cytological examination showed that Zengshengping, similar to retinamide, significantly reduced the incidence of esophageal cancer (Zengshengping vs. retinamide vs. placebo: 7.7% vs. 8.3% vs. 14.6%) [184]. The efficacy of Zengshengping in treating oral leukoplakia was also tested. In oral leukoplakia patients, Zengshengping exhibited a higher ORR than the placebo (67.8% vs. 17.0%) [185]. In the Zengshengping group, patients had lower levels of the oral leukoplakia biomarkers [argyrophilic nucleolar organizer region (AgNOR) and proliferating cell nuclear antigen (PCNA)] compared to those in the placebo group [185].

Astragali Radix decoction significantly lowered the recurrence rate of gastric precancerous lesions in patients within 6 months, compared to amoxicillin + metronidazole + omeprazole treatment (3.1% vs. 25%). After a 3-month treatment, the herbal decoction group had a significantly higher DCR compared to the Western medicine group (96.9% vs. 75.0%) [186].

Echan Jianwei Formula, a prescription created by a TCM doctor, demonstrated significantly better efficacy compared to vitacoenzyme in managing gastric precancerous lesions. In the herbal formula group, the DCR of patients was significantly higher compared to the vitacoenzyme group (73.4% vs. 60.4%). The results from gastroscopy and histopathology of the stomach showed that ORRs were higher in the herbal formula group than in the vitacoenzyme group (gastroscopy: 73.4% vs. 66.6%; histopathology 79.5% vs. 68.7%) [187].

In a 3-arm study, Fuwei Kangyi Formula, an herbal prescription created by a TCM doctor, and vitacoenzyme showed similar efficacy in treating chronic atrophic gastritis, while their combination achieved better results (ORR of Fuwei Kangyi Formula vs. vitacoenzyme vs. combination: 85% vs. 77.5% vs. 97.5%). Results from gastroscopy and histopathology showed that, after a 3-month treatment, the lesions regressed in all three groups, and the combination therapy group had the best result. B-cell lymphoma 2 (Bcl-2), cyclooxygenase-2 (COX-2), survivin, and p16 are molecules involved in the development of gastric cancer. The combination treatment upregulated p16 level and lowered Bcl-2, COX-2, and survivin levels in the lesions, and the effects of the combined treatment were the best among the three treatments [188].

Huatan Xiaoyu Formula, a 10-herb prescription created by a TCM doctor, combined with rabeprazole achieved a better response rate in treating gastric precancerous lesions compared to rabeprazole alone (ORR: 90.90% vs. 71.87%). The combined therapy was also better in alleviating epigastric pain, gastric fullness, and loss of appetite compared to rabeprazole alone. In the combined treatment group, serum levels of the GI hormones gastrin and motilin were higher, and the tumor markers CEA, CA19-9, CA125, and CA72-4 were lower compared to the rabeprazole group [189].

Huatan Xiaoyu Granule (based on an 11-herb prescription created by a TCM doctor) in combination with vitacoenzyme showed better efficacy in alleviating symptoms (epigastric pain, acid reflux, and nausea and vomiting) in patients with intestinal metaplasia compared to vitacoenzyme alone. The combined treatment was more effective in regulating the expression of two miRNAs involved in the development and progression of gastric cancer. In the combined treatment group, gastric-juice miR-133a level was higher and miR-421 level was lower compared to the vitacoenzyme treatment group. Results of gastroscopy showed that the combined therapy was better at reversing gastric mucosal atrophy, intestinal metaplasia, and dysplasia [190].

Weifuchun Tablet is a PHD approved by the NMPA in 1982. It has been widely used for treating gastric precancerous lesions and as a postoperative adjuvant in the treatment of gastric cancer in China [200]. A clinical trial showed that, in patients with gastric precancerous lesions, Weifuchun Tablet treatment was better at alleviating clinical symptoms, and improving gastroscopy and histopathology results compared to vitacoenzyme treatment alone. Weifuchun Tablet treatment achieved higher rates of reversal of both atrophy and intestinal metaplasia compared to vitacoenzyme treatment alone (gastric mucosal atrophy: 80% vs. 23.33%; intestinal metaplasia: 73.33% vs. 26.67%). The study also found that the increase of *Parabacteroides*, a member of intestinal microbiome, contributes to the development of gastric precancerous lesions. Weifuchun Tablet treatment decreased *Parabacteroides* to the level of the healthy group, while vitacoenzyme treatment had no impact on the abundance of *Parabacteroides* [191].

Jiawei Huangqi Jianzhong Formula, a TCM prescription, combined with celecoxib achieved a better impact on inflammation and immune homeostasis, evidenced by higher serum levels of IL-10, IL-17A, and IFN-γ compared to celecoxib treatment alone. Jiawei Huangqi Jianzhong Formula decreased anaemia caused by celecoxib. Serum Hb levels were higher in the combination therapy group than in the celecoxib group [192].

Moluodan is an NMPA-approved over-the-counter drug for treating chronic atrophic gastritis and stomachache. In 2019, Moluodan was included in the Management of Epithelial Precancerous Conditions and Lesions

in the Stomach (MAPS II) for managing chronic atrophic gastritis with dysplasia [201]. A clinical study demonstrated that Moluodan had the highest efficacy in reversing low-grade dysplasia compared to folic acid and the combination of Moluodan and folic acid. Dysplasia disappearance rates in patients who received Moluodan, folic acid, and their combination were 82.8%, 53.9%, and 61.1%, respectively. No Moluodan-related adverse effects were reported [193].

Weiyanfu Formula, a prescription created by a TCM doctor, exerted higher efficacy than omeprazole in treating gastric precancerous lesions (ORR: 98.2% vs. 94.6%) [194].

Summary and future perspectives

For managing cancers and precancerous lesions in the upper digestive tract, CHDs were mainly used as adjuvants (132 CHDs: 126 CHDs for cancer treatment, 6 CHDs for precancerous lesions management) to conventional therapies, and in some cases, they were used as monotherapy (6 CHDs, for precancerous lesions management). As adjuvants, all 132 CHDs enhanced the efficacy, particularly increased survival rates or prolonged mOS, and/or reduced the toxicities of conventional therapies. Specifically, 68 CHDs enhanced ORR, 30 CHDs increased DCR, 34 CHDs increased survival rates and/or prolonged mOS, 70 CHDs improved QOL, and 38 CHDs improved immune function of patients compared to mono-conventional therapies. Seventy-five CHDs reduced adverse effects/toxicities of the conventional therapies: 16 CHDs reduced liver injury and 10 CHDs reduced kidney injury induced by chemotherapies, 62 CHDs reduced myelosuppression and 64 CHDs reduced GI reactions caused by conventional therapeutics, six CHDs reduced radiation pneumonitis and nine CHDs reduced radiation esophagitis induced by radiotherapy, 11 CHDs reduced neurotoxicity induced by chemotherapies, two CHDs ameliorated pain of gastric cancer patients, and nine CHDs relieved patients' symptoms of fatigue. When used alone, some CHDs slowed disease progression from precancerous lesions to malignant tumors. The reviewed clinical trials include 104 studies on gastric cancer, 61 on esophageal cancer, two on laryngeal cancer, two on oral leukoplakia, one on esophageal epithelial hyperplasia, and 11 on gastric precancerous lesions. None of the clinical studies evaluated the efficacy of CHDs with respect to oral lip cancer, salivary gland cancer, hypopharyngeal cancer, oropharyngeal cancer, or gastroesophageal junction cancer. Only one clinical study explored the mechanisms of action of the studied CHD. Our work has limitations, such as only studies published in Chinese or English were included. Nevertheless, the collected evidence indicates that CHDs, either administered in combination with conventional therapies or as standalone agents, show clinical benefits for the treatment of upper digestive tract cancers.

Five-year survival rate is the most important index for assessing clinical benefits of cancer treatments. In the reviewed studies on cancer treatment, the combinations of Sishen Jiedu Decoction and the CF regimen [57], Pingxiao Tablet with radiotherapy [17], and Fuzheng Guben Granule with radiotherapy [22] all resulted in increased 5-year survival rates for patients with esophageal cancer compared to conventional therapy alone. Additionally, Buyang Huanwu Tang combined with 5-FU [51] improved 5-year survival rates for patients with gastric cancer compared to 5-FU alone. Notably, Sishen Jiedu Decoction, when paired with the CF regimen, not only enhanced the 5-year survival rate of stage II-III esophageal cancer patients but also reduced the incidence of adverse effects compared to the CF regimen alone [57]. Sishen Jiedu Decoction has also been used in combination with radiotherapy for treating esophageal cancer [35, 36]; however, this combined treatment was not reported to increase the 5-year survival rate of patients. Although the mechanisms underlying the improved clinical outcomes are not yet understood, these studies suggest that the combination of Sishen Jiedu Decoction and CF regimen is an ideal option for treating esophageal cancer.

The primary goal of cancer prevention is to reduce cancer incidence. In the reviewed studies for managing precancerous lesions, Zengshengping is the sole CHD demonstrated to reduce cancer incidence in subjects with severe esophageal dysplasia [184]. The study involved two centers and a large sample size of 2,523 participants [184]. The clinical benefits of Zengshengping in preventing esophageal cancer have been validated by compelling evidence.

Despite their positive roles in treating diseases, including upper digestive tract cancers, CHDs have not yet achieved global acceptance. The primary barriers hindering the international recognition of CHDs are: 1) a lack of convincing clinical evidence, 2) unclear mechanisms of action, and 3) indistinct active components. To provide compelling clinical evidence, standardized clinical trials are necessary. Although many efforts have been made, studies regarding the use of CHDs for the treatment of upper digestive tract cancers still require significant improvements. Initially, we screened 1,492 clinical trials, however only 659 were randomly controlled trials, and merely 181 met our inclusion criteria (Fig. 2). Sample size calculations are important for avoiding the rejection of true findings and the approval of false results. However, only two of the reviewed clinical studies conducted power analysis in the sample size calculation step. Sample sizes of the eligible trials are between 60 to 2,247. Most of

the trials included fewer than 200 subjects, with only five trials having sample sizes greater than 200. Only seven of the eligible studies were multi-center trials, while the remaining trials were conducted in a single hospital. The majority of eligible clinical reports were published in Chinese, and only seven reports were in English, making it challenging for non-Chinese speakers to access the information. Clinical studies on CHDs should include a power analysis for sample size calculation, aim for a substantial sample size, and be conducted in multiple centers, thereby reinforcing the reliability and replicability of the results in different populations. Moreover, to broaden the audience and enhance accessibility, it is advisable to publish research findings in multiple languages.

Well-designed preclinical pharmacological studies can help verify and explain the clinical benefits of CHDs. The studies should include multiple doses and positive controls. The biggest problem is that no eligible preclinical pharmacological studies were related to clinical trials. Preclinical pharmacological studies should be designed based on clinical findings. If a CHD is used as an adjuvant to chemotherapy in the treatment of cancer, the mechanisms of action of the CHD in combination with the chemotherapy drug should be studied using proper pharmacological models. To understand the mechanisms of action of CHDs, either used alone or in combination with conventional therapies, patient samples should be collected from clinical trials and analyzed using artificial intelligence-aided methods, followed by confirmation in animal and/or cell models.

Identification of the active components in CHDs is essential for understanding their mechanisms of action. Regrettably, we did not find any studies that had conducted chemical analyses of CHDs to explore their active components in managing upper digestive tract cancers. The clinical efficacy of CHDs relies on their chemical constituents and/or the constituents' metabolites in the circulation [202]. Therefore, chemical identification of compounds in human circulation, followed by validation in pharmacological models, is an effective strategy for identifying bioactive compounds of CHDs. Although challenging, with the aid of modern technology, some researchers have conducted studies using this strategy. In a single-center, randomized, open-label, and multiple-dose clinical trial, Chen et al. analyzed the components of Lianhuaqingwen Capsule, a PHD for treating COVID-19 pneumonia [203]. They further identified active components of the drug using biochromatography [203]. We recommend using our proposed strategy to identify compounds in CHDs, either alone or in combination with conventional therapeutics, for treating upper digestive tract cancers.

In clinical, pharmacological and chemical studies, it is essential to standardize the studied CHD preparations. CHDs often exhibit variability in composition due to differences in raw material sources and preparation protocols, which can lead to inconsistent study results. To achieve standardization, it is critical to establish stringent quality control measures, such as using high-performance liquid chromatography (HPLC) for chemical fingerprinting and setting content standards for their active constituents [204].

With advancements in demonstrating clinical efficacy, clarifying mechanisms of action, and identifying active constituents, it is anticipated that CHDs will assume an increasingly critical role in the management of upper digestive tract cancers.

In summary, our review of the literature has confirmed that CHDs indeed offer benefits to patients with upper digestive tract cancers and to individuals with precancerous conditions in the upper digestive tract, although their mechanisms of action and anticancer components are not fully understood. We have outlined specific recommendations aimed at enhancing the methodological design and reproducibility of clinical and preclinical studies. We anticipate that our contributions will: 1) facilitate a deeper understanding of the role of CHDs in managing precancerous and malignant conditions of the upper digestive tract; 2) assist researchers specializing in upper digestive tract cancer in designing high-quality clinical, pharmacological, and chemical studies that aim to demonstrate the clinical efficacy, elucidate the mechanisms of action, and identify the bioactive compounds of CHDs; and 3) enable physicians to develop evidence-based therapeutic regimens, incorporating CHDs as adjunctive or alternative treatments for upper digestive tract malignancies.

Abbreviations

5-FU	5-Fluorouracil
AgNOR	Argyrophilic nucleolar organizer region
Bcl-2	B-cell lymphoma 2
BENC	Bo-Er-Ning Capsule
CA125	Cancer antigen 125
CA19-9	Carbohydrate antigen 19-9
CA72-4	Cancer antigen 72-4
CAM	Complementary and alternative medicine
CAPOX	Capecitabine + 5-FU
CEA	Carcinoembryonic antigen
CF	Cisplatin + 5-FU
CHD	Chinese herbal drug
CNKI	China Academic Journals Full-text Database
COX-2	Cyclooxygenase-2
CR	Complete remission
CX	Cisplatin + capecitabine
CYFRA21-1	Cytokeratin 19 fragment
DCF	cisplatin + docetaxel + 5-FU
DCR	Disease control rate
DFS	Disease-free survival
DOF	Docetaxel + oxaliplatin + 5-FU
D-LA	D-lactic acid

ECF	Cisplatin + epirubicin + 5-FU
ECX	Cisplatin + epirubicin + capecitabine
EOX	Epirubicin + oxaliplatin + capecitabine
ESCC	Esophageal squamous cell carcinoma
FAM	5-FU + doxorubicin + mitomycin
FJQR	Fuzheng jiedu Quyu Method-based Formula
FLOT	5-FU + leucovorin + oxaliplatin + docetaxel
FOLFOX	Leucovorin + 5-FU + oxaliplatin
FP	Cisplatin + 5-FU
FU-LV	5-FU + leucovorin calcium
GI	Gastrointestional
Hb	Haemoglobin
HE4	Human epididymis protein 4
IFN-γ	Interferon-γ
IGF-1	Insulin-like growth factor 1
IL-4	Interleukin 4
KPS	Karnofsky Performance Scale
β2-MG	β2-Microglobulin
MAPS II	Management of Epithelial Precancerous Conditions and Lesions in the Stomach
MIP-3α	Macrophage inflammatory protein 3α
mOS	Median overall survival
MMP-9	Matrix metalloproteinase-9
MVD	Micro-vessel density
NGAL	Neutrophil gelatinase-associated lipocalin
NMPA	National Medical Products Administration
ORR	Objective response rate
PC	Carboplatin/Paclitaxel
PCNA	Proliferating cell nuclear antigen
PECAM-1	Platelet endothelial cell adhesion molecule
PFS	Progression-free survival
PGI	Pepsinogen I
PG-SGA	Patient-generated subjective global assessment
PHD	Proprietary herbal drug
QLQ-C30	Quality of Life Questionnaire-Core 30
QLQ-OES18	Quality of Life Questionnaire-Oesophageal Module 18
QOL	Quality of life
RBC-C3bRR	Red cell C3b receptor
RBC-ICRR	Red blood cell immune complex rosette rate
S-1	Tegafur + gimeracil + oteracil
SCC-Ag	Squamous cell carcinoma antigen
Smad7	Mothers against decapentaplegic homolog 7
SOX	S-1 + oxaliplatin
TCM	Traditional Chinese medicine
TEX	docetaxel + capecitabine + oxaliplatin
TGF-β1	Transforming growth factor-β1
TGFβ1RI	Transforming growth factor β1 type I receptor
TP	cisplatin + paclitaxel
TTF-1	Thyroid transcription factor-1
VEGF	Vascular endothelial growth factor
WBC	White blood cell
XELOX	capecitabine + oxaliplatin

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12943-024-02149-x.

Supplementary Material 1.

Acknowledgements
We thank Miss Yunfan Xi for helping collecting references.

Authors' contributions
Alexis SY Huang and JY Wu contributed equally to this work. ZL Yu conceived and designed the review; ZL Yu, Alexis SY Huang, JY Wu, XQ Fu wrote the manuscript; Alexis SY Huang prepared figures and tables; A AMIN edited the manuscript; ZL Yu and XQ Fu finalized the manuscript. All authors have reviewed the manuscript.

Funding
This study was financially supported by Food and Health Bureau (HK) (HMRF, No.19200791) and Research Talent Hub for ITF Projects (ITF, No.PiH/107/24).

Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 10 August 2024 Accepted: 7 October 2024
Published online: 08 November 2024

References

1. Kuhn MA, Amin MR: Upper Digestive Anatomy and Function. In Encyclopedia of Otolaryngology, Head and Neck Surgery. Edited by Kountakis SE. Berlin, Heidelberg: Springer Berlin Heidelberg; 2013: 2949-2952.
2. Global Cancer Observatory: Cancer Today [https://gco.iarc.who.int/today,].
3. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, Jemal A. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2024;74:229–63.
4. Global Cancer Observatory: Cancer Tomorrow (version 1.1) [https://gco.iarc.fr/tomorrow].
5. Ferlay J, Colombet M, Soerjomataram I, Parkin DM, Piñeros M, Znaor A, Bray F: Cancer statistics for the year 2020: An overview. Int J Cancer 2021.
6. Allemani C, Matsuda T, Di Carlo V, Harewood R, Matz M, Nikšić M, Bonaventure A, Valkov M, Johnson CJ, Estève J, et al. Global surveillance of trends in cancer survival 2000–14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries. Lancet. 2018;391:1023–75.
7. Anand U, Dey A, Chandel AKS, Sanyal R, Mishra A, Pandey DK, De Falco V, Upadhyay A, Kandimalla R, Chaudhary A, et al. Cancer chemotherapy and beyond: Current status, drug candidates, associated risks and progress in targeted therapeutics. Genes Diseases. 2023;10:1367–401.
8. Vasan N, Baselga J, Hyman DM. A view on drug resistance in cancer. Nature. 2019;575:299–309.
9. Richardson MA, Sanders T, Palmer JL, Greisinger A, Singletary SE. Complementary/alternative medicine use in a comprehensive cancer center and the implications for oncology. J Clin Oncol. 2000;18:2505–14.
10. Molassiotis A, Fernadez-Ortega P, Pud D, Ozden G, Scott JA, Panteli V, Margulies A, Browall M, Magri M, Selvekerova S, et al. Use of complementary and alternative medicine in cancer patients: a European survey. Annals of Oncology. 2005;16:655–63.
11. Cheung F. TCM: Made in China. Nature. 2011;480:S82–3.
12. Chen L, Fu Y, Zhang L, Zhao S, Feng Q, Cheng Y, Yanai T, Xu D, Luo M, An SW, et al. Clinical application of traditional herbal medicine in five countries and regions: Japan; South Korea; Mainland China; Hong Kong, China; Taiwan, China. Journal of Traditional Chinese Medical Sciences. 2015;2:140–9.
13. Liu J, Wang S, Zhang Y, Fan HT, Lin HS. Traditional Chinese medicine and cancer: History, present situation, and development. Thorac Cancer. 2015;6:561–9.
14. Shi JY, Qiang WS, Liang LS, Ping ZL, Ping XL: Clinical analysis on the Treatment of Middle-Advanced Esophageal Carcinoma by the

Combination of Brucea Javanica Oil Emulsion and Radiotherapy. China Journal of Chinese Materia Medica. 2008;33.
15. Xiangming K, Lijun X, Ni Z: Clinical Observation on Treating Advanced Esophageal Cancer with Emulsion Injection of Seminal Oil plus Radiotherapy. Zhejiang Journal of Integrated Traditional Chinese and Western Medicine. 2004:11-12.
16. Shan G-y. Zhang S, Li G-w, Chen Y-s, Liu X-a, Wang J-k: Clinical evaluation of oral Fructus Bruceae oil combined with radiotherapy for the treatment of esophageal cancer. Chin J Integr Med. 2011;17:933–6.
17. Hua LR, Dong YJ, Qing LZ: Radiotherapy combined with cooperative ping xiao piece in the treatment of esophageal cancer. Cancer Research on Prevention and Treatment. 1995:316+319.
18. yong Z, Jie B, Chao WQ: Observation on the long-term efficacy of Huisheng Oral Liquid Combined with Radiotherapy for the Treatment of Esophageal Cancer. Hebei Medical Journal. 2000:371.
19. En LA, Zong LY, Hua HY: Clinical Observation of Irisquinone Combined with Radiotherapy in Treatment of Esophageal Carcinoma. Chinese Journal of Clinkal Oncology and Rehabilitation. 2001:25.
20. Yao JZ, Zhi ZX, Jian HB, Fei WX: Clinical Observation of Irisquinone Capsule Combined with Radiotherapy on 62 Cases of Esophageal Carcinoma. Chinese Journal Of Clinical Oncology. 1999:79-80.
21. Bing L. Effect of integrated therapy of traditional Chinese and western medicine on serum CYFRA21-1, CA19-9 and immune function in patients with intermediate or advanced esophageal cancer. Shanxi Journal of Traditional Chinese Medicine. 2022;38:27–30.
22. Wen XD, Cheng YY, Zeng LH, Cun ZL: Effect of Fuzheng Guben Granules on mid-terminal esophagus cancer with radio therapy. Chinese Traditional Patent Medicine. 2007:484-486.
23. Zhong FY, Ke ZF. Clinical Analysis of the Short-Term Outcome of three-dimensional conformal intensity modulated radiotherapy plus TCM Aiyishu in the Treatment of Advanced Esophageal Cancer. Electronic Journal of Clinical Medical Literature. 2019;6:164.
24. Nan S, Li ND: Clinical Research on Elemene Emulsion Combined with Linear Accelerator Radiotherapy on Middle-Advanced Esophageal Carcinoma. Clinical Medicine of China. 2000:79-80.
25. Tao L, Wen-lan C, Xian-wen W, Yu L, Tai-feng Y. Effect of Three-dimensional Conformal Intensity-modulated Radiotherapy Combined with Elemene Injection on Serum Tumor Markers and T-lymphocyte Subsets in Patients with Esophageal Cancer. Progress in Modern Biomedicine. 2021;21:1253–6+1291.
26. Yu ZJ, Xiang DY, Ping HX: Observation on the efficacy of Sensitization of High-dose Danshen in Radiotherapy for Esophageal Cancer. Modern Journal of Integrated Traditional Chinese and Western Medicine. 1999:0-0.
27. Jie WY, Yang L, Duo MB, Gui PK, Ming SX: Yanshu Injection Combined with External Irradiation in the Treatment of Esophageal Carcinoma. Journal of Practical Oncology. 2002:283-284.
28. Zhao JX, Li XF, Wang XX. Effects of body-resistance strengthening and tumor-suppressing granules on immune adhesion function of red blood cells and expression of metastasis protein CD44 in tumor cells of patients with esophageal carcinoma. World J Gastroenterol. 2007;13:4360–4.
29. Xia YY. Clinical Efficacy and Safety Analysis of Cinobufotalin Combined with Radiotherapy for Esophageal Cancer. Sichuan Journal of Anatomy. 2019;27:119–20.
30. Gen Zm, Jun ZA, Quan CZ, Chen WG: Efficacy and safety of Kanglaite Combined with Radiotherapy in Treatment of elderly patients 75 years of age and older with Esophageal Carcinoma. Chinese Journal of Gerontology. 2006:1127-1128.
31. Ye-qin D, Yu-xin L, Jin-rong Z, Yan-chun H: Clinical study of the combination Liu Wei Di Huang Tang Hua Cai and radiotherapy for cancer of the esophagus. Chinese Journal of Cancer Prevention and Treatment. 2006:1428-1429.
32. Ming YS, Ping ZA, Sheng CJ: Clinical Research on Shenqi Liuwei Dihuang Tang Combined with Radiotherapy in Treatment of Esophageal Carcinoma. Guangming Journal of Chinese Medicine. 2008:145-146.
33. Zehua H. Sijunzitang Combined Conventional Radiotherapy for Esophageal Cancer Randomized Parallel Group Study. Journal of Practical Traditional Chinese Internal Medicine. 2014;28:74–6.
34. Qiang Caoxia GJ, Wang Pei, Lu Zhuoyue: Observation of curative effect of Xiangsha Bazhen Decoction on elderly patients with esophageal cancer treated by radiotherapy. Liaoning Journal of Traditional Chinese Medicine:1-10.
35. Guang LL. The curative effects of the Sishen Jiedu decoction on esophageal cancer. Chinese Journal of Traditional Medical Science and Technology. 2018;25:601–3.
36. Jing H, Jie SY: The curative effects of the Sishen Jiedu decoction on esophageal cancer. Health Guide. 2023:211-213.
37. Xiang ZF: Effects of Xuefu Zhuyu Tang on Radiotherapy on Middle-Advanced Esophageal Carcinoma. Qianwei Journal of Medicine. 1996:55.
38. Dong-mei W, Guan-jun L: Effect of Yangzhengxiaoji Capsule on the Quality of Life of the Esophageal Cancer by Radiotherapy. Journal of Henan University of Science & Technology(Medical Science). 2014, 32:109-111.
39. DING Zhao jun SY, YIN Qiang,et al.: Observation of The Close Effect of Radiotherapy Combined with Antike on Esophageal Carcinoma. Journal of Qilu Oncology. 2000:638-639.
40. Can-hui L, Jia-hai C, Yun-ping C, Qing-mu W. Clinical Study of Liushen Pill Combined with Radiotherapy in the Treatment of Esophageal Cancer and Its Effect on Inflammatory Microenvironment and Inhibition of Angiogenesis of Esophageal Cancer. Journal of Oncology in Chinese Medicine. 2023;5:25–9.
41. Xing HW, Yi ZY, Jie L: Effect of Astragalus Polysaccharide for Injection on Quality of Life of Patients with Esophageal Cancer after Radiotherapy. Jiangxi Journal of Traditional Chinese Medicine. 2007:37-38.
42. Jinqin D, Tingting W, Li C, Chenbin W, Xiaofeng T, Jintong W. Effect of Three-dimensional Conformal Radiotherapy Combined with Lianqi Capsules on Traditional Chinese Medicine Symptom Scores, Tumor Marker Levels and Immune Function of Patients with Middle and Advanced Esophageal Cancer. Chinese and Foreign Medical Research. 2023;21:37–40.
43. Tingting G, Jingyong D. Shan;YU L: Observation on clinical effect of Fuzheng Guben Quxie prescription combined with intensity modulated radiotherapy in treatment of Stage III-IV gastric cancer. Journal of Xinjiang Medical University. 2023;46:832–6.
44. Yan DH, Bo L, Yue SJ. Clinical Observation on Yangzheng Sanjie Decoction on Abdominal Lymph Node Metastasis After Surgery of Gastric Cancer. Guangming Journal of Chinese Medicine. 2022;37:4499–503.
45. Yan-wei G. Clinical Study of Chemotherapy Plus Boerning Capsules for Advanced Gastric Cancer. Nei Mongol Journal of Traditional Chinese Medicine. 2015;34:65–6.
46. Qiang JZ, Le W, Jian H, Ju LH, Jun CX, Zhe QJ, Meng JM, Jing WX, Na G: Observation on the clinical efficacy of Yangzheng Xiaoji capsule combined with capecitabine in the treatment of advanced gastric cancer. Home Medicine. 2018:150.
47. Xin W, Yahui H. Clinical Analysis of Shenyi Jianzhong Decoction Combined with S-1 in Treatment of Advanced Gastric Cancer. Acta Chinese Medicine. 2017;32:1844–8.
48. Jia TK. Efficacy and Safety of Shenyi Jianzhong Decoction Combined with S-1 in Treatment of Middle-Advanced Gastric Cancer. Chinese Journal of Clinical Rational Drug Use. 2021;14:85–7.
49. Fanming K, Lu Z, Na W, Dou Z, Ziwei W, Qingyun M, Yongchao Y, Yingjie J. The FJQR Has Synergistic Effect with Fluoropyrimidine in the Maintenance Treatment for HER-2 Negative Gastric Cancer. Recent Patents on Anti-Cancer Drug Discovery. 2024;19:165–75.
50. Wei L, Shuai Z, Jiang D, Hua L. Effects of Xiaoaitang based on the pathogenesis theory of cancerous toxin combined with laparoscopic assisted distal gastrectomy in the treatment of elderly patients with gastric cancer. Journal of Practical Oncology. 2018;33:222–7.
51. Yun LS, Ting W, You ZL, Gui ZL: Efficacy Observation of High-Dose Astragali Radix in the Treatment of 96 Cases of Advanced Gastric Carcinoma. Chinese Journal of Rural Medicine and Pharmacy. 2000:13.
52. Bin L. A Clinical Observation of Treatment on Elderly Patients with Advanced Gastric Cancer with Fufang Hongdoushan Capsule Combined and Gimeracil and Oteracil Porassium Capsules. Global Traditional Chinese Medicine. 2014;7:22–3.
53. Hao Y. Effect of Shenqi Jianwei Decoction Combined with Tiggio Capsule in Treating Senile Gastric Cancer with Qi and Blood Deficiency

Syndrome and Its Effects on the Expression of Serum MMP-2, MMP-9. Acta Chinese Medicine. 2018;33:529–32.
54. Wei GZ, Dong YG, Bin WX, Fu GY, Ying QG, Rong CS. Clinical Observation of Jiaweilizhong Decoction Combined with S-1 in Treatment of Advanced Gastric Cancer. Hubei Journal of Traditional Chinese Medicine. 2015;37:3–4.
55. Okabe H, Kinjo Y, Obama K, Hosogi H, Hata H, Asao Y, Harada H, Manaka D, Itami A, Teramukai S, Sakai Y. A Randomized Phase II Study of S-1 Adjuvant Chemotherapy With or Without Hochu-ekki-to, a Japanese Herbal Medicine, for Stage II/III Gastric Cancer: The KUGC07 (SHOT) Trial. Front Oncol. 2019;9:294.
56. Guang WZ, Fen SX, Hong SH, Jie ZS, Wen LP. Clinical Observation on 30 Cases of Advanced Gastric Cancer Treated with Jianpi Huazheng Tang Combined with Tegafur. New Chinese Medicine. 2011;43:98–9.
57. Yunlai J. The curative effects of the Sishen Jiedu decoction on esophageal cancer. Clinical Journal of Chinese Medicine. 2022;14:97–9.
58. Li S, Chenxin Z, Yao X, Xiaohong Z. Clinical Observations of Tongguanteng Oral Solution for Advanced Esophageal Carcinoma. Liaoning Journal of Traditional Chinese Medicine. 2023;50:89–91.
59. Zhi-liang Y, Peng Z, Zhi-ming T, Zhi-zhong P. Effects of Xiaoaiping tablets combined with 5-fluorouracil and cisplatin on immunity, tumor markers, angiogenesis and related factors in patients with advanced esophageal cancer. Journal of Hainan Medical University. 2019;25:627–30+634.
60. Zhang BX, Hua B: Observation on the Short-Term Efficacy of Fuzheng Guben Tang Combined with Chemotherapy in the Treatment of Middle-Advanced Esophageal Carcinoma. Journal of Sichuan of Traditional Chinese Medicine. 2007:48-49.
61. Zhen YD, Yang Y. Shugan Jiangni Method Combined with DF Regimen for the treatment of Esophageal Carcinoma in 30 cases. Yunnan Journal of Traditional Chinese Medicine and Materia Medica. 2010;31:36–7.
62. Mei SG. Yegeyin No.2 Combined with Chemotherapy in the Treatment for 30 cases of Middle-Advanced Esophageal Carcinoma. Yunnan Journal of Traditional Chinese Medicine and Materia Medica. 2009;30:32–3.
63. Pan B, Zang J, He J, Wang Z, Liu L. Add-On therapy with Chinese herb medicine Bo-Er-Ning capsule (BENC) improves outcomes of gastric cancer patients: a randomized clinical trial followed with bioinformatics-assisted mechanism study. Am J Cancer Res. 2018;8:1090–105.
64. Wen YQ, Ming Z, Juan JZ, Yun D, Qing C, Feng LW. Influence of Shidao Tongjie Decoction as Adjuvant to Chemotherapy on Survival Time and Immunologic Function of Advanced Esophageal Squamous Cell Carcinoma Patients. Journal of Traditional Chinese Medicine. 2017;58:1838–41.
65. Yue CX, Ming Z, Juan JZ, Lei L, Qing C, Jun GY, Yun D, Ning ZY, Ji ZZ. Effects of Shidao Tongjie Granules combined with chemotherapy on disease- free survival in patients with esophageal squamous cell carcinoma at stage IIB- IIIC after radical resection. Shanghai Journal of Traditional Chinese Medicine. 2019;53:54–7.
66. Yue CX, Wen YQ, Feng LW, Juan JZ, Ming Z, Qing C, Lei L, Jun GY, Yun D, Ning ZY. Short term efficacy observation of Shidao Tongjie Granule combined with chemotherapy in the treatment of advanced esophageal cancer. Shanghai Journal of Traditional Chinese Medicine. 2017;51:44–7.
67. Zumu D, Kuang W, Jing L. Clinical Study on Esophageal Cancer Treated with Esophageal Pingsan Combined with Paclitaxel Chemotherapy. Clinical Journal of Traditional Chinese Medicine. 2021;33:1581–4.
68. Xiao-zhi Y, Xiao-meng S, Rui-na Y. Clinical study on Lianqi Capsules combined with TP chemotherapy scheme in treatment of advanced esophageal cancer. Drugs & Clinic. 2021;36:2601–5.
69. Li-chun H, Li-jian Z, Lin S, Wen-qing C, Yuan-de X. Clinical study on Yunzhi Tangtai Capsules combined with TC regimen in treatment of esophageal cancer. Drugs & Clinic. 2019;34:3076–81.
70. Peng-fei S, Wei L, Shu-ti H. Clinical study on Yunzhi Tangtai Capsules combined with TP chemotherapy regimen in treatment of middle or advanced esophageal cancer. Drugs & Clinic. 2020;35:2373–7.
71. Yuyu G, Shasha Y, Xiaowan X, Xiaofeng Z. Clinical observation of Tongguanteng oral liquid combined with docetaxel-nedaplatin regimen in treatment of middle and advanced esophageal cancer. Journal of Digestive Oncology. 2024;16:88–93.
72. Qingli C, Dongyang M, Yanhui H, Liang G. Qing'an C: Clinical Observation of Jianpi Wenzhong Decoction and Chemotherapy in Treatment of Advanced Gastric Cancer. Liaoning Journal of Traditional Chinese Medicine. 2018;45:974–6.
73. Xin-jie W. Clinical Efficacy of Tongye Oral Liquid on the KPS and QOL of Esophageal Carcinoma. Chinese Archives of Traditional Chinese Medicine. 2010;28:2455–7.
74. Xia LY, Yong FX. Clinical value of Liujunzi Tang-assisted TP Regimen in the Treatment of Advanced Esophageal Carcinoma and Its Effect on TGF-β1/Smad pathway. Modern Digestion & Intervention. 2019;24:1162–5.
75. Hui ZZ, Mei F. Clinical Efficacy of Shenzhu Jiedu Decoction Combined with Conventional Therapy in Patients with Gastric Cancer Undergoing Chemotherapy. Chinese Traditional Patent Medicine. 2021;43:3555–9.
76. Yin'gang Z, Yinfeng X. Effect of Jianpi Tongluo Prescription Combined with Chemotherapy on Quality of Life in Patients with Advanced Esophageal Carcinoma. Journal of New Chinese Medicine. 2020;52:108–11.
77. Fei ZX, Lin ZF. 48 Cases of Advanced Gasrtic Cancer Treated with Oral Lotion of Brucea Javanica Oil Combined with DCF Regimen. Shaanxi Medical Journal. 2012;41:1209–11.
78. Yali M, Chunzheng M, Peimin L, Hongxin S, Li H, Mingyue S, Juan Z, Xifeng Y. Clinical Studies on Shenhu Banxia Decoction in Improving Efficacy of IIIB-IV Gastric Cancer and Mechanism. World Chinese Medicine. 2017;12:1808–11+1815.
79. Min NS, Hua CS, Lin CH. The clinical efficacy of Traditional Chinese Medicine in the Palliative Treatment of Advanced Gastric Cancer. Chinese Rural Health Service Administration. 2015;35:378–9.
80. Jing XX, Hong ZL, Wen CY, Feng LY: Analysis of Curative Effect of Matrine Combined Chemotherapy Treatment on Advanced Gastric Cancer. Liaoning Journal of Traditional Chinese Medicine. 2007:1742-1743.
81. Li-fu W. Clinical study on Pingxiao Capsules combined with TPF regimen in treatment of locally advanced laryngeal cancer. Online First Drugs & Clinic. 2019;34:1529–33.
82. Liyun Y. Clinical effect of TPF chemotherapy combined with Pingxiao capsule in the treatment of locally advanced laryngeal cancer. Chinese Medical Digest: Otorhinolaryngology. 2022;37:123–6.
83. Leixia M, Lei W. Effect-enhancing and Toxicity-reducing Functions of Fuzi Lizhong Tang on Postoperative Chemotherapy in Patients with Gastric Cancer of Spleen-stomach Cold-deficiency Pattern. Western Journal of Traditional Chinese Medicine. 2019;32:50–2.
84. Ni F, Lin LX: Clinical Efficacy of Traditional Chinese Medicine Combined with Chemotherapy for Gastric Cancer. Medical Information 2015:47-48.
85. Zhan YP, Huang XE, Cao J, Lu YY, Wu XY, Liu J, Xu X, Xiang J, Ye LH. Clinical safety and efficacy of Kanglaite® (Coix Seed Oil) injection combined with chemotherapy in treating patients with gastric cancer. Asian Pac J Cancer Prev. 2012;13:5319–21.
86. Ping C, Weida Z, Honglan G, Junbiao S: Clinical analysis on the Treatment of Late Gastric Cancer by the Combination of Cidan Capsule with ELF Chemotherapy Plan. World Journal of Integrated Traditional and Western Medicine. 2007:167-169.
87. Yu FH. Application of Jianpi Hewei Keai Tang Combined with Chemotherapy After Radical Gastrectomy. Chinese Journal of Traditional Medical Science and Technology. 2021;28:646–7.
88. Ying D. Efficacy of the Jianwei Sanjie prescription and FOLFOX chemotherapy on disease-free survival of elderly patients with gastric cancer after resection. Clinical Journal of Chinese Medicine. 2021;13:44–7.
89. Shuang SG. The role of Shengxue Tang in the Comprehensive Treatment of Advanced Gastric Cancer. Journal of Sichuan of Traditional Chinese Medicine. 2011;29:67–9.
90. Pei WP, Hua LZ, Jing ZY, Xia SC, Rong XX. 36 Cases of Advanced Gasrtic Cancer Treated with Huazhuo Hewei Sanjie Decoction Combined with FOLFOX Regimen. Chinese Journal of Integrated Traditional and Western Medicine on Digestion. 2010;18:403–4.
91. Chen SQ, Guo ZL, Ling WJ. Clinical Observation of Wenyang Huazheng Tang Combined with Chemotherapy in Treatment of Advanced Gastric Cancer. Journal of Sichuan of Traditional Chinese Medicine. 2014;32:73–4.
92. Xin ZL. Efficacy and safety of TCM medicine plus chemotherapy in the treatment of postoperative patients with gastric cancer. Practical Clinical Journal of Integrated Traditional Chinese and Western Medicine. 2017;17:87–8.

93. Shan ZW, Ming ZD, Bing HS, Hui ZY. Clinical research of Huangqi Injection combined with Danshen Injection in Treatment of Advanced Gastric Cancer. Hebei Journal of Traditional Chinese Medicine. 2020;42:1175–8+1182.
94. Yanjun C, Ning L. Clinical Observation on Xiangsha Liujunzi Decoction in the Treatment of Adverse Reactions of Chemotherapy of Gastric Cancer. Chinese Medicine Modern Distance Education of China. 2021;19:107–108129.
95. Hong XY: Observation on the efficacy and impact on quality of life of TCM Combined with Chemotherapy in Patients with Advanced Gastric Cancer. Diet Health. 2021:97-98.
96. Yan Z, Fen ZY. 47 Cases of Advanced Gasrtic Cancer Treated with Buxu Jiedu Decoction Combined with Chemotherapy. Chinese Journal of Traditional Medical Science and Technology. 2017;24:365–6.
97. Shuang C, Ya W, Jie Z, Ping L, Mei-shu H, Jia H, Nian C, Wen-wen J. Effect of Spleen-Strengthening Stomach-Nourishing Decoction combined with chemotherapy on T cell subgroups and coagulation markers in patients with gastric cancer. China Journal of Modern Medicine. 2023;33:24–9.
98. Wu LZ, Liang WD, Fu PX, Pan Z. Effect of Jianpi Huayu Decoction on Immune Function and Toxicity for Patients with Gastric Cancer before and after Chemotherapy. Journal of Sichuan of Traditional Chinese Medicine. 2019;37:92–6.
99. Long ZX, Zhe WF, Zhan Z, Bai L. Effect of TCM formula Combined with classical FOLFOX Regimen on Quality of Life in Patients with Gastric Cancer. Chinese Journal of Public Health Engineering. 2019;18:287–9.
100. Qiu ZQ: Effect of TCM formula Combined with FOLFOX6 Regimen on Quality of Life in Patients with Middle-Advanced Gastric Cancer. Modern Journal of Integrated Traditional Chinese and Western Medicine. 2016;25.
101. Junquan J. Application of Dialectical Addition and Subtraction of Xuezheng Decoction Combined with Chemotherapy in Patients with Advanced Gastric Cancer and Its Effects on Serum Tumor Markers and Immune Status. Journal of Sichuan of Traditional Chinese Medicine. 2019;37:98–101.
102. Zhi-quan Q, Li-qin L, Guo-rong Y, Guo-qing W, Qian X, Tong-wei Z, Liang G, Ai-hong Z. Elemene Combined OLF Program of Treatment of Advanced Gastric Cancer. Chinese Archives of Traditional Chinese Medicine. 2010;28:435–7.
103. Zheng YZ. Clinical efficacy and impact on quality of life of Huayu Jianpi Tang Combined with FOLFOX4 Regimen in patients with Advanced Gastric Cancer. Traditional Chinese Medicinal Research. 2022;35:43–8.
104. Yuefei L. Effect of Shiyiwei Shenqi Recipe on Immune Function of Patients with Advanced Gastric Cance. Chinese Medicine Modern Distance Education of China. 2021;19:86–7.
105. Hua L, Li G, Bin H, Lei L, Li L. Regulation of Shenling Baizhu Powder on Intestinal Microflora, Intestinal Barrier and Immune Function in Gastric Cancer Patients with Chemotherapy After Operation. Anti-tumor Pharmacy. 2020;10:477–82.
106. Ju X. Efficacy of TCM spleen righting combination chemotherapy in advanced gastric cancer. Journal of Medical Forum. 2013;34:57–8.
107. Ju DC, Lin WT, Su GY. Clinical Observation on the Quality of Life in Patients with Advanced Gastric Cancer Treated by Jianpi Bushen Yiqi Yangxue Decoction. Journal of Hebei Traditional Chinese Medicine and Pharmacology. 2011;26:24–5.
108. Bo JH: Clinical Efficacy of Liujunzi Tang Combined with Chinese actinidia root for Advanced Gastric Cancer. The World of Healthy Living. 2021:68-69.
109. Xia XY, Lin WS. Clinical Effect of TCM Combined with the FOLFOX4 Regimen in Treatment of Advanced Gastric Cancer. Chinese Journal of Rural Medicine and Pharmacy. 2011;18:45–6.
110. Jiangli F, Dongfang L, Jiao J, Jiyun T, Fangfang H, Ya H. Effect of Combined Treatment of Weifu Formula and Chemotherapy on the Quality of Life in Advanced Gastric Carcinoma Patients with Spleen Deficiency and Toxin Accumulation Syndrome. Journal of Traditional Chinese Medicine. 2015;56:120–3.
111. Mao M, Yonghao S, Ning J, Yanping L. Clinical Study on Treatment of Advanced Gastric Cancer with Chinese Herbal Compound Combined with FOLFOX4 Regimen. Shandong Journal of Traditional Chinese Medicine. 2020;39:1075–9.
112. Fulong L, Yiwen Q, Hongwei W, Yuhai D, Jin T, Hongmei N, Shengquan F. Clinical study of Huosu Yangwei Oral Liquid combined with SOX chemotherapy in intervention of advanced gastric cancer. Academic Journal of Shanghai University of Traditional Chinese Medicine. 2023;37:23–30.
113. Junran Z, Shengquan F, Qilong C, Hongmei N, Yuhai D, Fulong L, Zhichao F, Yuxuan Z. Clinical observation of Huosu Yangwei Syrup combined with SOX chemotherapy regimen in treating advanced gastric cancer. Shanghai Journal of Traditional Chinese Medicine. 2021;55:50–4.
114. Xu Y, Fang L, Jianhua X, Jue S, Yong Z, Ping L. Random Parallel Control Study of Jianpi Jiedu Tang Plus Chemotherapy in the Treatment of Liver Metastatic Gastric Cancer. Journal of Practical Traditional Chinese Internal Medicine. 2016;30:45–9.
115. Qiao Y, Wei LJ. Analysis of the application effect of Aidi Injection Combined with SOX Regimen in Treatment of Advanced Gastric Cancer. Shanxi Medical Journal. 2021;50:1149–52.
116. Ming L, Yijun M, Guoxiong C, Xiaoming P. Clinical Study on Aidi Injection Assisted with SOX Regimen for Advanced Gastric Cancer. New Chinese Medicine. 2024;56:117–21.
117. Jun JX. Clinical Observation on 134 Cases of Middle-Advanced Gastric Cancer Treated with Chemotherapy Combined with TCM. Chinese Journal of Ethnomedicine and Ethnopharmacy. 2018;27:107–11.
118. Xiaoli Y. Effect of Buzhong Xiaowei Decoction on Survival Quality and Clinical effect of Patients with Advanced Gastric Cancer Undergoing Chemotherapy. Acta Chinese Medicine. 2017;32:1849–52.
119. Dong-dong G, Jing Z, Hua-hua L. Effects of Chanpi Ezhu Decoction on Adjuvant Chemotherapy in the Treatment of Gastric Cancer. World Journal of Integrated Traditional and Western Medicine. 2021;16:2329–33+2337.
120. Tao YJ. Clinical Therapeutic Effect of Chemotherapy Combined with TCM on 45 Cases of Middle-Advanced Gastric Cancer. Chinese Journal of Ethnomedicine and Ethnopharmacy. 2019;28:110–1+114.
121. Ying WH. The effect of Modified Bazhen Decoction Combined with SOX Regimen on Blood Cells in patients with Advanced Gastric Cancer. Journal of North Pharmacy. 2023;20:38–40+43.
122. Zhao W. Efficacy Observation of Fuzheng Xiaoliu Tang Combined with Western Medicine in the Treatment of Gastric Cancer. Modern Journal of Integrated Traditional Chinese and Western Medicine. 2017;26:2663–5.
123. Jing M. Recent Clinical Observation on Chemotherapy Combined with Shenyi Jianzhong Decoction in the Treatment of Advanced Gastric Cancer. Chinese Medicine Modern Distance Education of China. 2020;18:127–9.
124. Yunfeng B, Zhenhua H, Lian Z. Effect of Modified Xiaoxianxiong Decoction Combined with Tegafur-GimeracilOteracil Potassium Capsules and Oxaliplatin Chemotherapy in Treatment of Gastric Cancer and Its Effect on Serum Pepsinogen and Circulating Tumor Cells in Peripheral B. Chinese Archives of Traditional Chinese Medicine. 2023;41:255–8.
125. Zhen Z, Ping CX, Min RW. Zisheng Xiexin Tang in Treating 30 cases of SOX chemotherapy-induced oral mucositis. Traditional Chinese Medicinal Research. 2020;33:29–31.
126. Qun GG, Zhong ZB, Hua FY, Yan L, Xin CS. Effect of oral administration of traditional Chinese medicine combined with chemotherapy on peripheral blood T lymphocyte subsets and serum MMP-9, TIMP-1 and VEGF expression in elderly patients with gastric cancer. Chinese Journal of Gerontology. 2020;40:526–9.
127. Qingwei Y, Shilong P, Yan S. Clinical effect of Kanglaite injection combined with SOX regimen (teggio + oxaliplatin) in the treatment of patients with advanced gastric cancer (stage IIIB-IV). Clinical Research and Practice. 2021;6:14–6.
128. Ning ZX, Han XW: Efficacy and Impact on Quality of Life of Jianpi Huayu Decoction Combined with Chemotherapy in the Treatment of Advanced Gastric Cancer. Acta Chinese Medicine and Pharmacology. 2016;44.
129. Yalan H, Genping L. Effect of Jianpi Quyu decoction on toxicity, quality of life and physical condition of patients with advanced gastric cancer. Journal of Digestive Oncology. 2020;12:64–7.
130. Hang Z, Wei D. Clinical efficacy of the prescription of sparganii rhizoma and curcumae rhizoma as adjuvant chemotherapy in the treatment of gastric cancer. Oncology Progress. 2019;17:925–8.
131. Gang JB, Xia WZ, Hua WL. Clinical Observation of XELOX Regimen Combined with Yadanzi Oil Injection for the Treatment of 32 Patients

with Advanced Gastric Cancer. Guiding Journal of Traditional Chinese Medicine and Pharmacy. 2011;17:60–1.
132. Xingwang L, Jie W: Efficacy and safety of Shenzhu Jianyun Tiaoqi Decoction combined with chemotherapy for advanced esophageal carcinoma with spleen deficiency and Qi stagnation. Chinese Archives of Traditional Chinese Medicine:1-8.
133. Rui LG, Mian ZZ, Xun WH. Analysis of Clinical Effect of Adjuvant Yiqi Jiedu Method in the Treatment of Elderly Patients with Stage III-IV Gastric Cancer. The Journal of Medical Theory and Practice. 2023;36:2402–4.
134. Yu FH. Efficacy Observation of Fuzheng Huayu Tang Combined with Chemotherapy and Its impact on T Lymphocyte subsets in peripheral blood in Gastric Cancer. Chinese Journal of Traditional Medical Science and Technology. 2021;28:961–2.
135. Ying ZH, Ding WA, Jie Y, Heng D, Yuan L, Yue Z. Effect of Adjuvant Astragalus Polysaccharides on Peripheral Blood Th1/Th2 Cell Balance and Adverse Reaction in Gastric Cancer Patients with Postoperative Chemotherapy. Clinical Journal of Medical Officers. 2023;51:1298–300.
136. Qing-qing H, Jin-hua H. Efficacy observation of Jianpi Guben Huadu recipe and chemotherapy on advanced gastric cancer. Shanxi Journal of Traditional Chinese Medicine. 2021;37:26–7.
137. Pei X, Qi P, Jie G. Effect of Buzhong Yiqi Tang Combined with Chemotherapy on Short-term Prognosis and Quality of Life in Patients with Advanced Gastric Cancer. Modern Medicine and Health Research Electronic Journal. 2023;7:13–5.
138. Jinlong M. A clinical analysis of treating gastric cancer by the therapy of Jianpi Quyu in TCM. Clinical Journal of Chinese Medicine. 2015;7:101–2.
139. Huanhuan Z, Yonglei Z, Mengying M, Mojiao F. Clinical efficacy observation of Jianpi Yishen Formula combined with XELOX in the treatment of gastric cancer with Qi deficiency. Journal of Shanxi University of Chinese Medicine. 2023;24:795–9.
140. Feng TC. Effects of Huachansu Capsule Combined with XELOX Chemotherapy Regimen in Treatment of Elderly Patients with Advanced Esophageal Cancer. Henan Medical Research. 2019;28:718–20.
141. Qiang HW, Bao CM. Clinical Observation on 30 Cases of Advanced Gastric Cancer Treated with Qizhu Fuzheng Decoction Combined with Chemotherapy. Chinese Journal of Ethnomedicine and Ethnopharmacy. 2022;31:114–8.
142. Shan W: Effect of Patients with Middle-Advanced Gastric Carcinoma Receiving TCM Shenling Baizhu San During Chemotherapy. Medicine and Health. 2022.
143. Jun ZM. Clinical Efficacy of Chemotherapy Combined with the Method of Protecting Spleen and Stomach in Patients with Stomach Cancer. Jilin Medical Journal. 2013;34:266.
144. Yi Q. Clinical Application of Huangqi Jianzhong Tang in the Treatment of Patients with Gastric Cancer of Spleen-stomach Cold-deficiency Pattern. Practical Clinical Journal of Integrated Traditional Chinese and Western Medicine. 2020;20:81–2+102.
145. Chengyin L, Yifang X, Jingling Z, Hongwei G, Mengying J, Jie Y, Lu Z. Clinical observation of the effect of Jianpi Yangxue Decoction combined with chemotherapy of gastric cancer. China Medical Herald. 2022;19:89–92.
146. Xiaodong C, Qilian L: Clinical Observation on Composite Salviae Dropping Pill Combined with FAM Regimen in the Treatment of Gastric Carcinoma. Chinese Journal of Integrated Traditional and Western Medicine On Gastro-spleen. 2004:42-44.
147. Lin ZH. Synergistic Effects of Shenqi Fuzheng Injection Combined with Chemotherapy in Treating Gastric Cancer. China Medical Engineering. 2014;22:104+106.
148. Xin D, Jian L, Kui TL, Yang ZC, Hua LL. Weining granules combined with chemotherapy for recurrent and metastatic gastric cancer. World Chinese Journal of Digestology. 2008;16:175–9.
149. Hua WZ, Qi C: Application of Xiangsha Yangwei Wan in the Comprehensive Treatment of Advanced Gastric Cancer. Modern Journal of Integrated Traditional Chinese and Western Medicine. 2001:2387.
150. Jun ZJ, Hua WJ, Song W, Fang WA, Chuan L, En ZF. Evaluating the Efficacy of ECF Chemotherapy in Combination with Fufang Kushen Injection for the Treatment of Advanced Gastric Carcinoma. Guangxi Medical Journal. 2010;32:533–5.
151. Ping Z. Clinic Observation of Compound Kushen (Matrine) Injection Combined with Chemotherapy for Middle-advanced Gastric Cancer. Drug Evaluation. 2013;10:36–8.
152. Yi Z, Ping L. Clinical study of Xianchan Tablets combined with chemotherapy in the treatment of elderly patients with esophageal cancer. Journal of Clinical Medicine in Practice. 2020;24:75–7+80.
153. Huang J, Sun Y, Fan Q. ZHANG Y: Efficacy of Shenyi Capsule combined with gemcitabine plus cisplatin in treatment of advanced esophageal cancer:a randomized controlled trial. Journal of Chinese Integrative Medicine. 2009;7:1047–51.
154. LIANG Qi-lian CX-d, LI Xiao-ying,et al.: Evaluate the Effect of Composite Salviae Dropping Pill Combined with PPF Regimen Chemotherapy in Patients with Advanced Esophageal Carcinoma. The Practical Journal of Cancer. 2005:78-80.
155. Feng YX, Bing HB, Lian WR: Huohua Kaitong Capsule Combined with Chemotherapy in Treating 106 cases of Middle-Advanced Esophageal Carcinoma. Chinese Journal of Integrated Traditional and Western Medicine. 2004:855-856.
156. Jun ZS, Ze WG. Effect of Fuzi Lizhong Decoction on Serum Levels of Pentraxin-3, CYFRA21-1, TTF-1 and HE4 in Postoperative Patients with Gastric Cancer. Journal of Chinese Medicinal Materials. 2016;39:914–7.
157. Bixiang L, Xiaoqin Z, Kai Z. Clinical Efficacy and Safety of Jianpi Jiedu Decoction Combined with Chemotherapy in Patients with Gastric Cancer. Chinese Archives of Traditional Chinese Medicine. 2019;37:2833–6.
158. Jing Y: Clinical Effect of Fuzheng Yiai Tang Combined with Chemotherapy in Treatment of Advanced Gastric Cancer. Journal of Traditional Chinese Medicine and Chinese Materia Medica of Jilin. 2005:17-18.
159. Xuan HY: Clinical analysis on the Treatment of Late Gastric Cancer by the Combination of Guishao Liujunzi Tang with Chemotherapy. Knowledge Library. 2017:235.
160. Xian HW, Feng LX, Fen SW, Zhi CJ, Jun LY: 84 Cases of Middle-Advanced Gasrtic Carcinoma Treated with Modified Xiangsha Liujunzi Decoction Combined with Chemotherapy. Fujian Journal of Traditional Chinese Medicine. 2007:15-16.
161. Yong L, Zhong LJ, Hang L, Jian F: Effects of Emulsion Injection of Seminal Oil Combined Chemotherapy on Immune Function in Patients with Gastric Cancer After Surgery. Journal of Guangxi Traditional Chinese Medical University. 2007;10.
162. Ming-juan Z, Cai-feng Z. Observation of clinical efficacy of Yanshu injection combined with NP chemotherapy in treatment of advanced gastric cancer. Chinese Journal of Clinical Oncology and Rehabilitation. 2010;17:531–3.
163. Cheng ZS. Clinical Analysis on Clinical Effects of Invigorating-spleen Removing-stasis Method on Recovery and Overall Survival of Patients After Surgery for Gastric Cancer. Guide of China Medicine. 2019;17:216–7.
164. Ying H. The effect of Invigorating-spleen Removing-stasis Method in the Treatment of Gastric Cancer. Nei Mongol Journal of Traditional Chinese Medicine. 2015;34:10–1.
165. Xiaojun LI, Chunlan FENG, Hailiang LUO, Dongji CHEN. Clinical Observation on 45 Cases with Esophageal Cancer in the Middle and Advanced Stage Treated with Bazhen Tang Combined with Chemoradiotherapy. Journal of Traditional Chinese Medicine. 2016;57:416–9.
166. Wei GS. Efficacy of the Bazhen decoction plus chemoradiation on immunologic function and the quality of life in patients with esophageal cancer in middle and advanced stage. Asia-Pacific Traditional Medicine. 2017;13:126–7.
167. Feng YY. Efficacy of the Bazhen decoction plus chemoradiation on immunologic function and the quality of life in patients with esophageal cancer in middle and advanced stage. Henan Medical Research. 2017;26:2187–8.
168. Juan P. A Clinical Study on the combination of Shenmai Injection and Concurrent Chemoradiotherapy for Advanced Esophageal Carcinoma. Journal of Traditional Chinese Medicine University of Hunan. 2011;31:30–1+34.
169. Hong CW. A Clinical Study on the combination of Shenmai Injection and Concurrent Chemoradiotherapy for Advanced Esophageal Carcinoma. China Practical Medicine. 2014;9:183–4.
170. An-dong L, Chong-hua L, Yuan-yuan W. The Effect of Shenmai Injection Combined with Radiotherapy on Elderly Patients with Advanced Esophageal Cancer. Medical Information. 2020;33:152–3.
171. Jiliu H. Clinical effectation of shenqifuzheng injection combined with concurrent chemoradiotherapy in treating esophageal carcinoma. Chinese Journal of Coal Industry Medicine. 2012;15:1244–6.

172. Cheng Q, Xiaodong Z, Bo L, Dubin L. Efficacy of cinobufotalin combined with concurrent chemoradiotherapy therapy for locally advanced esophageal cancer. Chinese Journal of Clinical Oncology and Rehabilitation. 2017;24:525–8.
173. Qing L, Yu RJ. Evaluating the Efficacy of mFOLFOX6 Chemotherapy Combined with Xiaoyanping in the Treatment of Advanced Esophageal Carcinoma. Guangxi Medical Journal. 2013;35:912–3+916.
174. De-lin J, Da-hai M. Effect of Huaier Granule on Immunity and Quality of Life in Patients with Gastric Cancer Undergoing Postoperative Concurrent Radiochemotherapy. China Cancer. 2010;19:73–6.
175. Dengxiang L, Na W, Lili H, Jun G, Yawei S, Xiaoyan Z, Zhi G, Yi J. Study on Kanglaite injection combined with apatinib in the treatment of advanced gastric cancer. Journal of North Sichuan Medical College. 2021;36:38–41.
176. Bo Y, Jie CX, Liang YQ. Efficacy of Kanglaite Injection Combined with Apatinib in the Treatment of Advanced Gastric Cancer After Failure of Second-Line Chemotherapy. Journal of Huaihai Medicine. 2021;39:63–6.
177. Yuxuan Z, Shengquan F, Yue Z, Mei Q, Mengyuan Z, Fulong L, Yuhai D, Yi W, Yiwen Q, Hongwei W. Clinical Efficacy of Huosu Yangwei Oral Liquid in Treatment of Adverse Reactions of Advanced Gastric Cancer with Apatinib. Acta Chinese Medicine. 2023;38:1296–302.
178. Hang ZS. Treatment of 71 cases of Elderly patients with advanced gastric cancer with Buzhong Xiaowei Tang combined and Western Medicine. Traditional Chinese Medicinal Research. 2019;32:32–4.
179. Shu-yue M, Dong-wei Z. Efficacy observation of Guben Xiaoai decoction, low-dose auxiliary apatinib and tegafur on gastric cancer with syndrome of deficiency-cold of spleen and stomach. Shanxi Journal of Traditional Chinese Medicine. 2022;38:25–8.
180. Xiang LX, Wei ZD. Efficacy observation of Yiyang Jianpi formula and tegafur and apatinib on advanced gastric cancer. Shanxi Journal of Traditional Chinese Medicine. 2022;38:34–6.
181. Tingbin W. Self-Made Decoction Combined with Western Medicine of Oral leukoplakia and Adverse Reactions. Chinese Archives of Traditional Chinese Medicine. 2014;32:1777–9.
182. Lai ZL, Qin ZZ, Ling ZF. The Efficacy of Modified Sanjiasan Combined with Recombinant Human P53 Adenovirus Injection in the Treatment of Blood Stasis Type Laryngeal Precancerous Lesions and Its Effect on Serum VEGF and β2-MG. Modern Journal of Integrated Traditional Chinese and Western Medicine. 2017;26:4058–60.
183. Collaborative group for phase III clinical trial of Zeng Sheng ping: Results of phase III clinical trial of Zeng Sheng ping in the treatment of patients with esophageal epithelial hyperplasia. Chinese Journal of Oncology. 2000:70-72.
184. Zhong LP, Sheng ZJ, Peng RZ, Rui H, Ping XS, Quan GR, Wei DZ, Xin WJ, Jin FH, Guo CS, Sheng GW: Medicamentous Inhibitory Therapy of Precancerous Lesions of the Esophagus-3 and 5 Year Inhibitory Effect of Antitum or B, Retinamide and Riboflavin. Acta Academiae Medicinae Sinicae. 1990:235-245.
185. Sun Z, Guan X, Li N, Liu X, Chen X. Chemoprevention of oral cancer in animal models, and effect on leukoplakias in human patients with ZengShengPing, a mixture of medicinal herbs. Oral oncology. 2010;46:105–10.
186. Li ZB. Clinical Study on Huangqi in the Treatment of Precancerous Lesions of Gastric Cancer. Guangming Journal of Chinese Medicine. 2013;28:719–20.
187. Chuyue Z, Liuxiang H, Simin K. Effect of invigorating spleen, removing phlegm and removing stasis therapy on 97 cases of precancerous gastric lesions. Clinical Journal of Chinese Medicine. 2019;11:87–9.
188. Dong G, Yi L. Study on the Effect of Fuwei Kangyi Decoction on the Expression of P16, bcl-2, cox-2, and Survivin in Gastric Mucosa in Patients with Gastric Precancerous Lesions. Inner Mongolia Journal of Traditional Chinese Medicine. 2022;41:37–9.
189. Ping CX, Sheng LX. Effect of Huatan Xiaoyu Decoction in the Adjuvant Treatment of Gastric Precancerous Lesions. Inner Mongolia Journal of Traditional Chinese Medicine. 2022;41:16–8.
190. Xiaoke F, Zhenyan L, Xuan L, Le G, Muxin W, Ping W. Effect of Huatan Xiaoyu Decoction on reversing gastric precancerous lesions and its influence on the expression of MiRNA in gastric juice exosomes. Modern Journal of Integrated Traditional Chinese and Western Medicine. 2021;30:936–9+970.
191. Bian Y, Chen X, Cao H, Xie D, Zhu M, Yuan N, Lu L, Lu B, Wu C, Bahaji Azami NL, et al. A correlational study of Weifuchun and its clinical effect on intestinal flora in precancerous lesions of gastric cancer. Chin Med. 2021;16:120.
192. Wei-guo S, Hua-na Y, Gan-hua G. Effects of Huang qi Jian zhong Tang combined with Celebrex on precancerous lesion histology and IL-10/IL-17 A in patients with deficiency cold of the spleen. Chinese Journal of Integrated Traditional and Western Medicine on Digestion. 2017;25:815–9.
193. Zou TH, Gao QY, Liu SD, Li YQ, Meng XJ, Zhang GX, Tian ZB, Zou XP, He S, Hou XH, et al. Effectiveness and safety of Moluodan in the treatment of precancerous lesions of gastric cancer: A randomized clinical trial. Journal of Digestive Diseases. 2024;25:27–35.
194. Heng WL, Tao LC, Sheng LP, Hao CM, Yong L, Juan GW, Feng ZJ, Huan NH, Lei DS. Observation on the Efficacy of TCM Weiyanfu in the Treatment of Gastric Precancerous Lesions with Syndrome of Stagnant Dampness-heat. Journal of Guangxi University of Chinese Medicine. 2014;17:19–21.
195. Xiao-juan Q, Xia D. Analysis of Usage and Rationality of Brucea Javanica Oil Emulsion Injection. Journal of Taizhou Polytechnic College. 2024;24:77–9.
196. Tao FX: Analysis of the effect of Pingxiao Tablets combined with chemotherapy in the treatment of malignant tumors of the digestive system. China Journal of Pharmaceutical Economics. 2012:127-128.
197. Kegang J, Gang F. Post-Marketing Systematic Review of Drug Safety of Huisheng Oral Solution. Pharmacology and Clinics of Chinese Materia Medica. 2021;37:155–64.
198. Jianzhao N, Jianfeng Z, Qiming Z. Overviews on Lrisquinone. Chinese Pharmaceutical Affairs. 2010;24:825–7.
199. MacDonald JS, Schein PS, Woolley PV, Smythe T, Ueno W, Hoth D, Smith F, Boiron M, Gisselbrecht C, Brunet R, Lagarde C. 5-Fluorouracil, doxorubicin, and mitomycin (FAM) combination chemotherapy for advanced gastric cancer. Ann Intern Med. 1980;93:533–6.
200. Xiao H, Junxiang L. Interpretation on the experts consensus for clinical application of Weifuchun in the treatment of precancerous lesions of gastric cancer. Chinese Journal of Integrated Traditional and Western Medicine on Digestion. 2023;31:122–5.
201. Pimentel-Nunes P, Libânio D, Marcos-Pinto R, Areia M, Leja M, Esposito G, Garrido M, Kikuste I, Megraud F, Matysiak-Budnik T, et al. Management of epithelial precancerous conditions and lesions in the stomach (MAPS II): European Society of Gastrointestinal Endoscopy (ESGE), European Helicobacter and Microbiota Study Group (EHMSG), European Society of Pathology (ESP), and Sociedade Portuguesa de Endoscopia Digestiva (SPED) guideline update 2019. Endoscopy. 2019;51:365–88.
202. Ren JL, Yang L, Qiu S, Zhang AH, Wang XJ. Efficacy evaluation, active ingredients, and multitarget exploration of herbal medicine. Trends Endocrinol Metab. 2023;34:146–57.
203. Chen X, Wu Y, Chen C, Gu Y, Zhu C, Wang S, Chen J, Zhang L, Lv L, Zhang G, et al. Identifying potential anti-COVID-19 pharmacological components of traditional Chinese medicine Lianhuaqingwen capsule based on human exposure and ACE2 biochromatography screening. Acta Pharm Sin B. 2021;11:222–36.
204. Leong F, Hua X, Wang M, Chen T, Song Y, Tu P, Chen X-J. Quality standard of traditional Chinese medicines: comparison between European Pharmacopoeia and Chinese Pharmacopoeia and recent advances. Chinese Medicine. 2020;15:76.

Publisher's Note