



Move Free

Updated: February 26, 2020.

OVERVIEW

Introduction

Move Free is a proprietary line of multi-ingredient dietary supplements (MIDS) marketed as aids for joint health and “to help ease joint discomfort, maintain strength and flexibility and help support and nourish cartilage”. The major ingredients in the products include glucosamine, chondroitin, hyaluronic acid and methylsulfonylmethane (MSM). There have been several reports of clinically apparent liver injury in patients taking Move Free products; however, the specific ingredient(s) in the various products that might cause liver injury has not been identified and these ingredients may no longer be included in currently available products.

Background

Move Free is a proprietary product name for an array of multi-ingredient herbal and dietary supplements (MIDS) meant to ease joint discomfort. The Move Free brand is currently produced by Reckitt Benckiser Group plc (Slough, England) which purchased its previous distributor, Schiff Nutrition International (Salt Lake City, UT), in 2012. The constituents of the various Move Free products vary, but are largely glucosamine, chondroitin and hyaluronic acid with various combinations of vitamins (vitamin D3), minerals (boron) and selected nutritional supplements such as krill oil and astaxanthin (a keto-carotenoid anti-oxidant). The ingredients and their concentrations in some of the products have been modified over time. Previous Move Free products have included mixtures of herbal agents including Chinese skullcap (*Scutellaria baicalensis*) and black catechu (*Acacia catechu*). Presently, however, Move Free products do not list any herbal constituents although several mention “Uniflex (FruiteX-B Calcium Fructoborate)”.

The common Move Free products that are currently marketed are given in the Table below with a listing of their ingredients as provided in the product labels. Because the products are considered dietary supplements, they are not subject to the usual efficacy and safety evaluation given to medications. However, all nutritional supplements are subject to rules regarding purity and good manufacturing practices. Dietary supplements are not recommended for specific medical conditions, but can be advertised as being supportive of general health or a specific tissue or organ health. These multi-ingredient products appear to be generally safe and well tolerated, but prospective studies of their efficacy, tolerance and safety have not been published.

Selected Move Free Products (February 2016)

Product Name	Condition	Major Listed Ingredients
Move Free Joint Health, Advanced	Joint Health	Glucosamine (1.5 g), Chondroitin (200 mg), Hyaluronic acid (3.3 mg), “Uniflex” FruiteX-B Calcium Fructoborate (216 mg).

Selected Move Free continued from previous page.

Product Name	Condition	Major Listed Ingredients
Move Free Joint Health, Advanced Plus with MSM	Joint Health	Glucosamine (1.5 g), Chondroitin (200 mg), Methylsulfonylmethane (MSM: 1.5 g), Hyaluronic acid (3.3 mg), "Uniflex" FruiteX-B Calcium Fructoborate (216 mg).
Move Free Joint Health, Advanced Plus MSM & Vitamin D3	Joint Health	Glucosamine (1.5 g), Chondroitin (200 mg), Methylsulfonylmethane (MSM: 750 mg), Vitamin D3 (2000 IU), Hyaluronic acid (3.3 mg), Uniflex [®] FruiteX-B Calcium Fructoborate (216 mg).
Move Free Joint Health, Night	Joint Health	Glucosamine (1.5 g), Chondroitin (200 mg), Melatonin (6 mg)
Move Free Ultra Faster Comfort Joint	Joint Comfort	Calcium (35 mg), Calcium fructoborate (216 mg)
Move Free Ultra Turmeric & Tamarind	Joint Comfort	Proprietary Blend (250 mg): Tamarindus indicus (seed) extract and Curcuma longa (rhizome) extract, microcrystalline cellulose
Move Free Ultra, Triple Action	Joint Health	Cartilage Blend (40 mg), Hyaluronic acid (3.3 mg), Boron (5 mg)
Move Free Ultra, Omega	Joint Health	Proprietary Blend (353 mg): Krill oil, Hyaluronic acid, Astaxanthin

Hepatotoxicity

The initial reports of liver injury attributed to Move Free were published in 2010, with subsequent reports in 2012 and 2013, all from the United States. These publications described an acute hepatocellular injury arising within 1 to 3 weeks of starting a Move Free product that contained glucosamine, chondroitin and a proprietary herbal mixture of Chinese skullcap (*Scutellaria baicalensis*) and black catechu (*Acacia catechu*). The injury was moderate in severity and resolved within 1 to 2 months of stopping the supplement. Immunoallergic and autoimmune features were not present, and the injury resolved without residual in all cases. One patient restarted the product after at least partial recovery and redeveloped a similar pattern of liver injury. While further cases have not been described, prospective studies of drug induced liver injury from the United States mentioned 3 cases of acute liver injury linked to Move Free products, all from 2012-2013. At present, Move Free products do not list a proprietary herbal component but do mention a proprietary mineral complex with a similar name: "Uniflex".

Likelihood score: C (probable rare cause of clinically apparent liver injury).

Mechanism of Injury

The liver injury attributed to Move Free products has been reported to be due to Chinese skullcap, but the mechanism by which this herb might cause liver injury is unexplained. Indeed, Chinese skullcap has hepatoprotective activity in animal models of liver disease. Contamination or misidentification of the herbal components is always a possibility in explaining the appearance of liver injury.

Outcome and Management

The liver injury that has been attributed to Move Free products has usually been mild-to-moderate in severity and self-limited in course, resolving in 1 to 2 months of stopping the preparations. Move Free has not been linked to instances of acute liver failure, chronic hepatitis or vanishing bile duct syndrome. In patients presenting with acute, unexplained liver injury, all HDS products should be discontinued and the case reported to federal registries. It is also helpful to carefully define what products were being taken and at what doses and for how long. Retrieval of the actual product or products can also be helpful as progress is being made in the identification of ingredients by advanced chemical and biochemical methods.

Drug Class: [Herbal and Dietary Supplements](#), Nutritional Supplements, Multi-Ingredient

CASE REPORT

Case 1. Repeated episodes of acute hepatitis after use of Move Free.(1)

A 78 year old woman osteoarthritis developed jaundice within 3 weeks of starting “Move Free Advanced”, a proprietary multi-ingredient nutritional supplement advertised to be helpful for joint discomfort. She had no history of liver disease, but had a previous cholecystectomy. She denied alcohol abuse and risk factors for viral hepatitis. She was taking no other medications except for multivitamins. On presentation, serum bilirubin was 7.2 mg/dL, ALT 1626 U/L, AST 1053 U/L, alkaline phosphatase 354 U/L and GGT 599 U/L. Tests for hepatitis A, B and C were negative. She was hospitalized and the Move Free product was stopped. She began to improve without specific therapy and was discharged after a few days (Table). Because her joint symptoms worsened, she restarted the Move Free product and redeveloped jaundice within two weeks. Her laboratory tests were again abnormal in a pattern similar to the initial episode. A liver biopsy showed acute hepatocellular injury with many eosinophils suggestive of drug induced liver injury. Tests for autoantibodies were negative and a CT scan of the abdomen showed no evidence of biliary obstruction or hepatic masses. At this point, the nutritional supplement was suspected to be the cause and was found to be Move Free Advanced and have glucosamine, chondroitin and two herbal ingredients, Chinese skullcap and black catechu listed together as “Uniflex Proprietary Extract: 200 mg”. She was told to avoid its further use and in follow up her symptoms resolved and liver tests improved.

Key Points

Medication:	Move Free Advanced
Pattern:	Hepatocellular (R=10)
Severity:	3+ (jaundice, hospitalization)
Latency:	3 weeks initially, 2 weeks on rechallenge
Recovery:	Not specified
Other medications:	Multivitamins

Laboratory Values

Time After Starting	Time After Stopping	ALT (U/L)	Alk P (U/L)	Bilirubin (mg/dL)	Other
3 weeks	0	1626	354	7.2	Presentation
5 weeks	2 weeks	678	279	2.3	Asymptomatic
Move Free Advanced restarted					
2 weeks	0	1206	286	4.7	Symptomatic
6 weeks	4 weeks	120	126	0.9	Asymptomatic
Normal Values		<60	<132	<1.2	

Comment

An elderly woman with osteoarthritis developed an acute hepatitis a few weeks after starting an herbal and dietary supplement called “Move Free Advanced” that was thought to contain glucosamine and chondroitin only, neither of which are considered hepatotoxic. No other cause for the hepatitis was identified, and her physicians assured her that glucosamine and chondroitin were not the reason for the liver injury. Upon restarting the multi-ingredient nutritional supplement, however, she redeveloped jaundice. On closer inspection, the product label of Move Free Advanced also listed a “proprietary” mixture of herbal agents which included Chinese skullcap (*Scutellaria baicalensis*) and black catechu (*Acacia catechu*). Chinese skullcap had been

implicated in rare cases of drug induced liver injury, although the association was not completely convincing. The recurrence of injury with a similar latency and pattern of enzyme elevations is very convincing evidence that the nutritional supplement was the likely cause of the episode, but the specific ingredient responsible is somewhat unclear and the injury may have been due to a contaminant or misidentified constituent in the proprietary mixture. Current formulations of Move Free products do not mention Chinese skullcap as an ingredient.

PRODUCT INFORMATION

REPRESENTATIVE TRADE NAMES

Move Free®

DRUG CLASS

Herbal and Dietary Supplements

COMPLETE LABELING

Product labeling at DailyMed, National Library of Medicine, NIH

CHEMICAL FORMULAS AND STRUCTURES

DRUG	CAS REGISTRY NUMBER	MOLECULAR FORMULA	STRUCTURE
Chondroitin	9007-27-6	(C14-H21-N-O12)n-	
Glucosamine	3416-24-8	C6-H13-N-O5	
Hyaluronic Acid	9004-61-9	Unspecified	

CITED REFERENCE

1. Yang L, Aronsohn A, Hart J, Jensen D. Herbal hepatotoxicity from Chinese skullcap: A case report. *World J Hepatol.* 2012;4:231–3. PubMed PMID: 22855699.

ANNOTATED BIBLIOGRAPHY

References updated: 26 February 2020

Abbreviations: HDS, herbal and dietary supplements.

Zimmerman HJ. Unconventional drugs. Miscellaneous drugs and diagnostic chemicals. In, Zimmerman, HJ. *Hepatotoxicity: the adverse effects of drugs and other chemicals on the liver.* 2nd ed. Philadelphia: Lippincott 1999; pp. 731-4.

(Expert review of hepatotoxicity published in 1999; Move Free products, glucosamine, chondroitin and hyaluronic acid are not discussed).

Seeff L, Stickel F, Navarro VJ. Hepatotoxicity of herbals and dietary supplements. In, Kaplowitz N, DeLeve LD, eds. *Drug-induced liver disease.* 3rd ed. Amsterdam: Elsevier, 2013, pp. 631-58.

(Review of hepatotoxicity of herbal and dietary supplements [HDS]; does not mention Move Free products, glucosamine, chondroitin or hyaluronic acid).

Russo MW, Galanko JA, Shrestha R, Fried MW, Watkins P. Liver transplantation for acute liver failure from drug-induced liver injury in the United States. *Liver Transpl.* 2004;10:1018–23. PubMed PMID: 15390328.

- (Among ~50,000 liver transplants reported to UNOS between 1990 and 2002, 270 [0.5%] were done for drug induced acute liver failure, including 7 [5%] for HDS, but the specific herbs and products implicated were not listed).
- García-Cortés M, Borraz Y, Lucena MI, Peláez G, Salmerón J, Diago M, Martínez-Sierra MC, et al. Liver injury induced by “natural remedies”: an analysis of cases submitted to the Spanish Liver Toxicity Registry. *Rev Esp Enferm Dig.* 2008;100:688–95. PubMed PMID: 19159172.
- (Among 521 cases of drug induced liver injury submitted to Spanish registry, 13 [2%] were due to HDS, but no Move Free product was implicated).
- Jacobsson I, Jönsson AK, Gerdén B, Hägg S. Spontaneously reported adverse reactions in association with complementary and alternative medicine substances in Sweden. *Pharmacoepidemiol Drug Saf.* 2009;18:1039–47. PubMed PMID: 19650152.
- (Review of 778 spontaneous reports of adverse reactions to HDS to a Swedish Registry found 31 with increased liver enzymes, 26 with elevated aminotransferase levels, 22 with mixed liver reaction and 12 with hepatitis; agents implicated in causing liver injury included valerian, ginseng, green tea, and aloe vera; glucosamine, chondroitin, skullcap, black catechu and Move Free products were not specifically mentioned).
- Linnebur SA, Rapacchietta OC, Vejar M. Hepatotoxicity associated with Chinese skullcap contained in Move Free Advanced dietary supplement: two case reports and review of the literature. *Pharmacotherapy* 2010; 30(7): 750, 258e-262e.
- (2 cases: 71 and 85 year old women with osteoarthritis developed fatigue a week after starting a Move Free product [containing Chinese skullcap] and were later found to have abnormal liver tests [peak bilirubin 2.0 and 0.2 mg/dL, ALT 650 and 54 U/L, Alk P 310 and 144 U/L], which resolved with 4-8 weeks of stopping).
- Reuben A, Koch DG, Lee WM; Acute Liver Failure Study Group. Drug-induced acute liver failure: results of a U.S. multicenter, prospective study. *Hepatology.* 2010;52:2065–76. PubMed PMID: 20949552.
- (Among 1198 patients with acute liver failure enrolled in a US prospective study between 1998 and 2007, 133 [11%] were attributed to drug induced liver injury of which 12 [9%] were due to HDS, including several herbal mixtures, usnic acid, Ma Huang, black cohosh, and Hydroxycut; Move Free products were not mentioned).
- Stickel F, Kessebohm K, Weimann R, Seitz HK. Review of liver injury associated with dietary supplements. *Liver Int.* 2011;31:595–605. PubMed PMID: 21457433.
- (Review of current understanding of liver injury from herbals and dietary supplements focusing upon Herbalife and Hydroxycut products, green tea, usnic acid, noni juice, Chinese herbs, vitamin A and anabolic steroids; no mention of Move Free, glucosamine, chondroitin or Chinese skullcap).
- Yang L, Aronsohn A, Hart J, Jensen D. Herbal hepatotoxicity from Chinese skullcap: A case report. *World J Hepatol.* 2012;4:231–3. PubMed PMID: 22855699.
- (78 year old woman with osteoarthritis developed jaundice 3 weeks after starting Move Free Advanced [bilirubin 7.2 mg/dL, ALT 1626 U/L, Alk P 354 U/L] which resolved on stopping, but recurred when she restarted the product [bilirubin 4.7 mg/dL, ALT 1206 U/L, Alk P 286 U/L], the product containing glucosamine and chondroitin but also “Uniflex Proprietary Extract” of Chinese skullcap and black catechu: Case 1).
- Dhanasekaran R, Owens V, Sanchez W. Chinese skullcap in move free arthritis supplement causes drug induced liver injury and pulmonary infiltrates. *Case Reports Hepatol.* 2013;2013:965092. PubMed PMID: 25431706.

- (62 year old woman developed shortness of breath and jaundice two weeks after starting a Move Free product [containing Chinese skullcap] with pulmonary infiltrates and abnormal liver tests [bilirubin 6.9 mg/dL, ALT 1247 U/L, Alk P 297 U/L], both liver and pulmonary abnormalities resolving within 8 weeks of stopping).
- Bunchorntavakul C, Reddy KR. Review article: herbal and dietary supplement hepatotoxicity. *Aliment Pharmacol Ther.* 2013;37:3–17. PubMed PMID: 23121117.
- (Systematic review of literature on HDS associated liver injury mentions that skullcap has been implicated in several cases of liver injury).
- Teschke R, Schulze J, Schwarzenboeck A, Eickhoff A, Frenzel C. Herbal hepatotoxicity: suspected cases assessed for alternative causes. *Eur J Gastroenterol Hepatol.* 2013;25:1093–8. PubMed PMID: 23510966.
- (Review of the literature of case series of suspected HDS related liver injury found evidence of other explanations for the liver injury in 19 of 23 publications involving 278 of 573 patients [49%], and that these other diagnoses weakened the causality assessment in most instances).
- Björnsson ES, Bergmann OM, Björnsson HK, Kvaran RB, Olafsson S. Incidence, presentation and outcomes in patients with drug-induced liver injury in the general population of Iceland. *Gastroenterology.* 2013;144:1419–25. PubMed PMID: 23419359.
- (In a population based study of drug induced liver injury from Iceland, 96 cases were identified over a 2 year period, including 15 [16%] due to herbal and dietary supplements, but none were attributed to a Move Free product or Chinese skullcap).
- Licata A, Macaluso FS, Craxì A. Herbal hepatotoxicity: a hidden epidemic. *Intern Emerg Med.* 2013;8:13–22. PubMed PMID: 22477279.
- (Review and commentary on herbal hepatotoxicity discusses pyrrolizidine alkaloids, green tea, Echinacea, kava, usnic acid, ephedra and products made by Herbalife, Hydroxycut and LipoKinetix; no mention of glucosamine, chondroitin, Chinese skullcap or Move Free products).
- Navarro VJ, Seeff LB. Liver injury induced by herbal complementary and alternative medicine. *Clin Liver Dis.* 2013;17:715–35. PubMed PMID: 24099027.
- (Review of HDS induced liver injury including regulatory problems, difficulties in diagnosis and causality assessment; mentions cases of liver injury attributed to Chinese skullcap, three of which were components of Move Free products).
- Navarro VJ, Barnhart H, Bonkovsky HL, Davern T, Fontana RJ, Grant L, Reddy KR, et al. Liver injury from herbals and dietary supplements in the U.S. Drug-Induced Liver Injury Network. *Hepatology.* 2014;60:1399–408. PubMed PMID: 25043597.
- (Among 85 cases of HDS associated liver injury [not due to anabolic steroids] enrolled in a US prospective study between 2004 and 2013, two [2.3%] were attributed to Move Free products).
- Rossi S, Navarro VJ. Herbs and liver injury: a clinical perspective. *Clin Gastroenterol Hepatol.* 2014;12:1069–76. PubMed PMID: 23924877.
- (Review of HDS induced liver injury including regulatory problems, difficulties in diagnosis and causality assessment; mentions several cases that have implicated Move Free products, most likely due to Chinese skullcap, although a single case report has implicated glucosamine).
- Navarro VJ, Lucena MI. Hepatotoxicity induced by herbal and dietary supplements. *Semin Liver Dis.* 2014;34:172–93. PubMed PMID: 24879982.
- (Review of HDS induced liver injury including regulatory problems, difficulties in diagnosis and causality assessment; does not discuss Move Free products).

Seeff LB, Bonkovsky HL, Navarro VJ, Wang G. Herbal products and the liver: a review of adverse effects and mechanisms. *Gastroenterology*. 2015;148:517–532.e3. PubMed PMID: 25500423.

(Extensive review of possible beneficial as well as harmful effects of herbal products on the liver mentions that multi-ingredient supplements have been implicated in many cases of liver injury including proprietary agents marketed under the names Herbalife, Hydroxycut and OxyELITE Pro; Move Free products are not mentioned).

Stickel F, Shouval D. Hepatotoxicity of herbal and dietary supplements: an update. *Arch Toxicol*. 2015;89:851–65. PubMed PMID: 25680499.

(Extensive review of liver injury due to HDS mentions that Herbalife has been implicated in 54 cases of liver injury, 7 with a positive rechallenge, but that the cause of the injury remains unknown and that few cases have been published since 2011; does not mention Move Free products).

Chalasanani N, Bonkovsky HL, Fontana R, Lee W, Stolz A, Talwalkar J, Reddy KR, et al; United States Drug Induced Liver Injury Network. Features and outcomes of 899 patients with drug-induced liver injury: The DILIN Prospective Study. *Gastroenterology*. 2015;148:1340–1352.e7. PubMed PMID: 25754159.

(Among 899 cases of drug induced liver injury enrolled in a prospective database between 2004 and 2012, HDS were implicated in 145 [16%], of which 2 were attributed to Move Free products: see Navarro, Barnhart et al. [2014]).

García-Cortés M, Robles-Díaz M, Ortega-Alonso A, Medina-Caliz I, Andrade RJ. Hepatotoxicity by dietary supplements: a tabular listing and clinical characteristics. *Int J Mol Sci*. 2016;17:537. PubMed PMID: 27070596.

(Tabular listing of implicated dietary supplements in published cases of liver injury does not mention glucosamine, chondroitin, Move Free or Chinese skullcap).

Brown AC. Liver toxicity related to herbs and dietary supplements: Online table of case reports. Part 2 of 5 series. *Food Chem Toxicol* 2017; 107(Pt A): 472-501.

(Description of an online compendium of cases of liver toxicity attributed to HDS products, mentions 2 cases that were attributed to Move Free which contained glucosamine and Skullcap [Linnebur 2010, Yang 2012]).

Medina-Caliz I, Garcia-Cortes M, Gonzalez-Jimenez A, Cabello MR, Robles-Diaz M, Sanabria-Cabrera J, Sanjuan-Jimenez R, et al. Spanish DILI Registry. Herbal and dietary supplement-induced liver injuries in the Spanish DILI Registry. *Clin Gastroenterol Hepatol*. 2018;16:1495–502. PubMed PMID: 29307848.

(Among 856 cases of drug induced liver injury enrolled in a Spanish registry between 1994 and 2016, 32 were due to an HDS including 7 attributed to green tea, 6 to Herbalife products, 2 to valerian, and 2 to cascara Sagrada, but none to a Move Free product).