Behind the Label: Hidden Ingredients in "Natural" Pain Relief Medications

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UTEP COP 2026

Objectives

- **Identify and review the potential risk factors** with hidden ingredients in natural supplements that may contain hidden glucocorticoids, NSAIDs, or other undisclosed compounds, and assess their potential risks.
- **Review the evidence** of potential serious risks associated with pain supplements leading to regulatory responses and warnings
- **Assess patient perceptions and misconceptions** regarding the safety of natural and OTC supplements.
- **Develop a structured clinical approach** to guide healthcare providers in counseling patients and assisting with the safe discontinuation of these supplements

Background

📊 57.6% Adults 20+ used at least one dietary supplement in the past 30 days

👵 80% Women aged 60 report supplement use

 1 in 4 Americans Live with chronic pain

🌿 52% Of individuals with chronic nonmalignant pain use complementary and alternative medicine

⚠️ ~23,000 emergency department visits and ~2,000 hospitalizations annually in the U.S. are linked to dietary supplements

💊 Recent OTC arthritis pain supplements of concern include:

Artri King, Atri Ajo King, Ortiga Ajo Rey, RM Flex, Advance King and contain hidden ingredients that are harmful(diclofenac, dexamethasone, and methocarbamol)

Geller AI et al. NEJM, 373(16), 1531–1540(2016, Mishra S et al. United States, 2017-2018. *NCHS Data Brief*. 2021;(399):1-8.
Lucas JW, Sohi I:. NCHS Data Brief. 2024,(518):CS355235. 10.15620/cdc/169630
Rosenberg EI et.al Pain Med. 2008, 9:1065-72. 10.1111/j.1526-4637.2008.00477

🏪 Artri-King in the U.S.

🛒 **Market Presence**

- Sold on **Amazon**
- Available in **U.S. grocery chains**

⚠️ **FDA Action (2022)**

- FDA warned consumers **not to purchase or use Artri** and **Ortiga** products

📄 **Regulatory Enforcement**

Official FDA warning letters sent to:

- Amazon
- Walmart
- Latin Foods Market

US Food and Drug Administration. Public notification: Artri King contains hidden drug ingredients. Published online April 20, 2022

FDA Warning Falls on Deaf Ears at Artri King

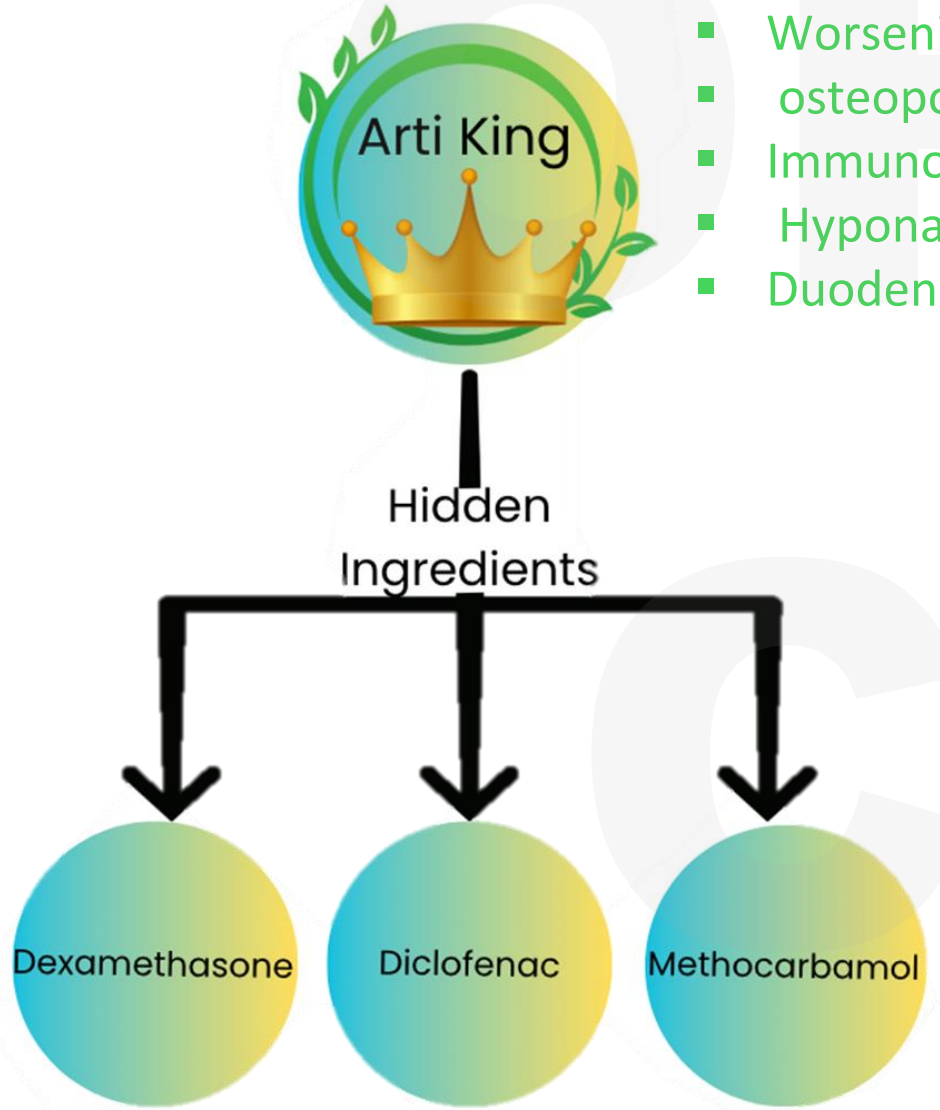
Two boxes of 'Artri Ajo King,' a supplement that the Food and Drug Administration has warned against people consuming, sits at the counter inside a local produce store on Mission, in San Francisco, Calif., on Sept. 17, 2025. Photo: Pablo Unzueta for El Tecolote/CatchLight Local

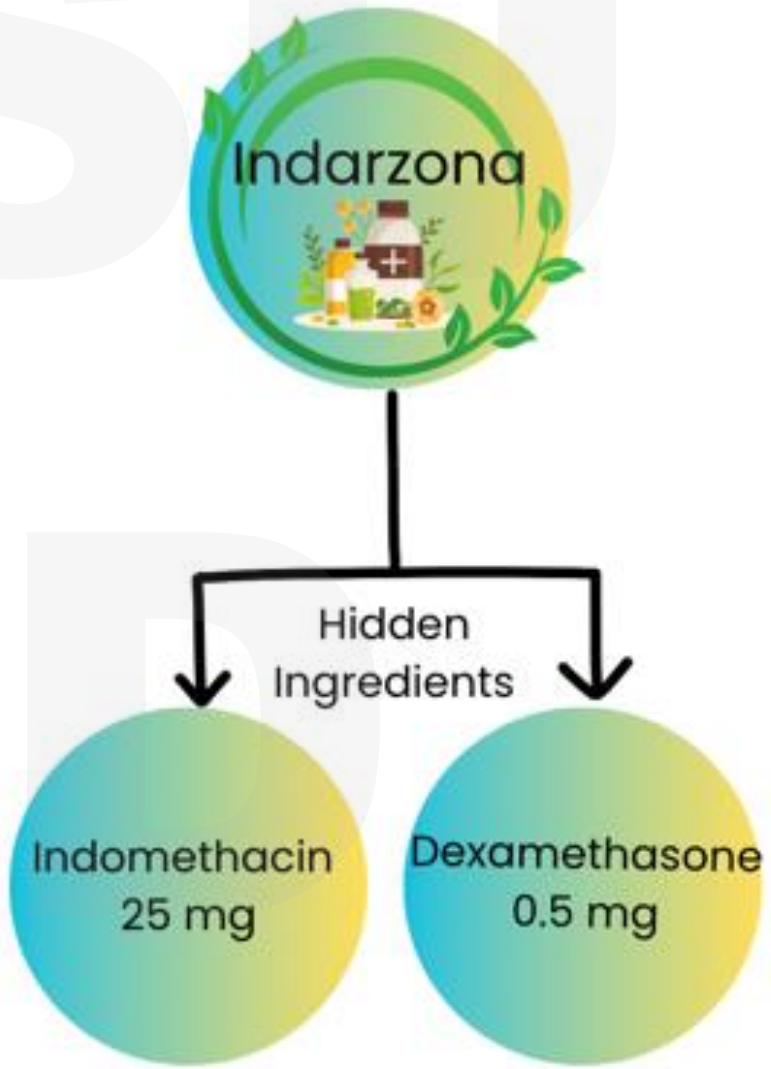
U.S. Customs seizes 102,000 banned pills in Cincinnati

One of six packages containing a combined total of 102,000 banned Artri King pills is shown at the Cincinnati Port of Entry after being seized over the weekend. Photo by U.S. Customs and Border Protection

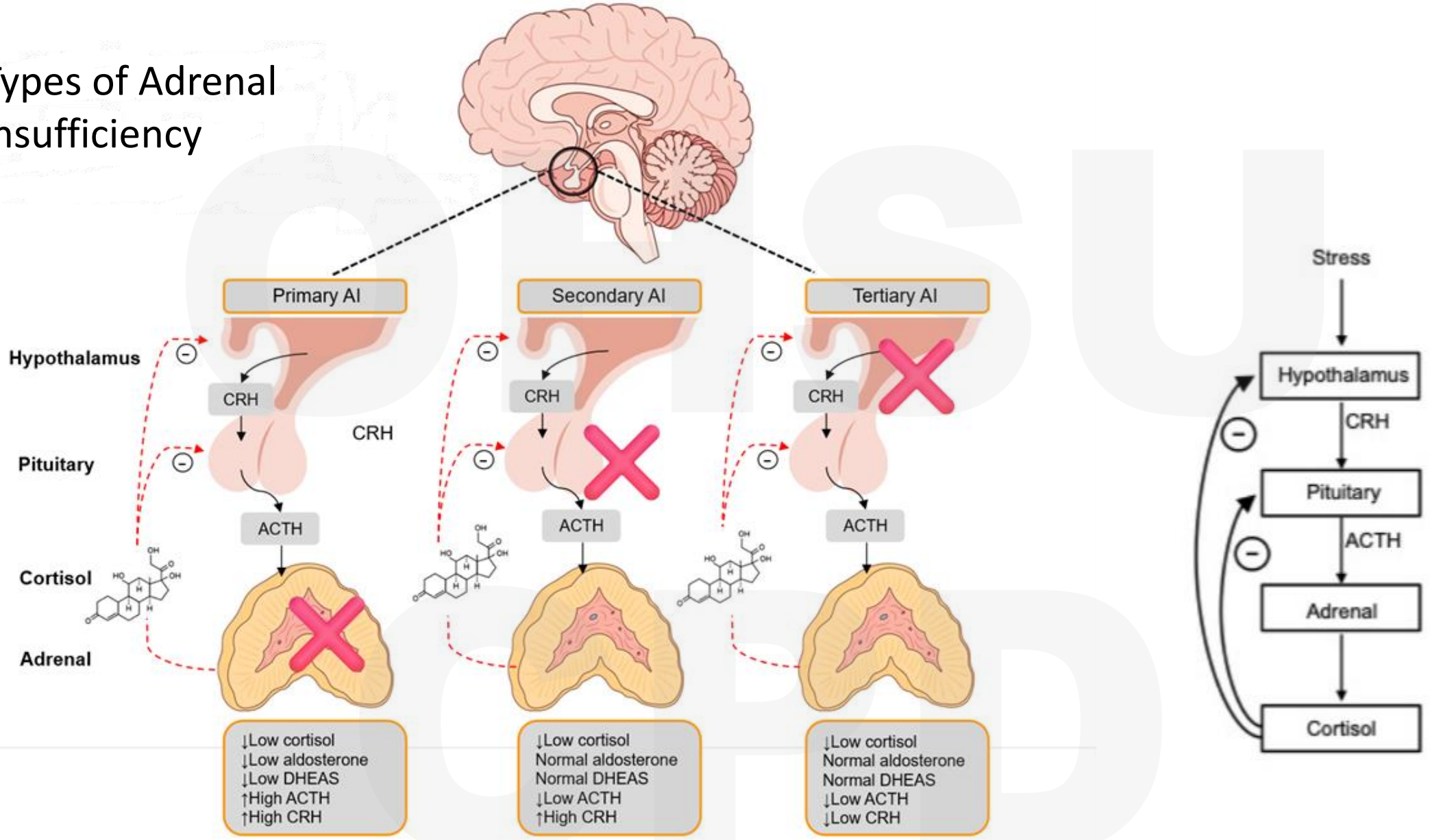
Examples of “Natural Pain Medications”

- Adrenal insufficiency
- Adrenal crisis
- Worsening glycemic control
- osteoporotic fractures
- Immunosuppression
- Hyponatremia,
- Duodenal ulcers





Types of Adrenal insufficiency



ACTH, adrenocorticotropic hormone; AI, adrenal insufficiency; CRH, corticotropin-releasing hormone; DHEAS, dehydroepiandrosterone sulfate.

Adapted from Kumar R et al. J Clin Pathol 2022;75: 435-442

Cushing Syndrome (Condition)	Symptoms / Clinical Features
Definition: Chronic high cortisol levels	**Fat Redistribution:** Moon face, buffalo hump, truncal obesity
Causes:	**Skin & Connective Tissue:** Purple striae, thin skin, easy bruising, poor wound healing, acne, hirsutism
• Exogenous: Long-term steroid use	**Musculoskeletal:** Proximal muscle weakness, osteoporosis, fractures
• Endogenous: Pituitary/adrenal tumors, ectopic ACTH	**Metabolic / Cardiovascular:** Hypertension, hyperglycemia, dyslipidemia
Mechanism: Excess cortisol disrupts metabolism, immune function, and fat distribution	**Neuropsychiatric:** Depression, anxiety, irritability, memory issues
	Reproductive / Other: Menstrual irregularities, decreased libido, increased infection risk

Feature	**Adrenal Insufficiency**	**Adrenal Crisis**
Onset	Gradual	Acute, sudden
Severity	Chronic, manageable	Life-threatening
Blood pressure	Mild hypotension	Severe hypotension/shock
Symptoms	Fatigue, weakness, weight loss, nausea, hyperpigmentation	Vomiting, diarrhea, dehydration, confusion, coma
Electrolytes	Mild disturbances	Severe: hyponatremia, hyperkalemia, hypoglycemia
Treatment	Daily glucocorticoids ± mineralocorticoids	IV hydrocortisone + aggressive fluids, supportive care

Drivers of Acquisition and Use

- Recommendations from friends or family
- Inadequate pain relief from provider recommended treatments
- Belief that the supplement was “natural”
- Patients reported acquiring the supplements abroad (n=3, 25%), at swap meets (n=3, 25%), or in small local stores (n=6, 50%).

Nguyen VD et al. Cureus. 2025;17(7):e88378

Therapeutic Benefits and Associated Adverse Effects

- All interviewed patients reported significant pain relief from supplement use.
- Three patients noted improved energy and/or mobility
- One patient was able to discontinue the use of a walker.

Seven patients reported side effects :

- weight gain or increased appetite (n=3)
- dizziness (n=1)
- weakness (n=1)
- leg swelling (n=1)
- mood changes (n=1)
- non-healing wounds (n=1)

Nguyen VD et al. Cureus. 2025;17(7):e88378

The Adverse Effects of Artri King: A Systematic Review and Case Series

TABLE 1. Diagnostic characteristics of patients using Artri King supplements

Patient no.	Sex	Age, y	Presenting complaint	Medical history	Frequency of taking Artri King	Duration of taking Artri King, mo
1	M	65	Cellulitis of finger	Gout	2 applications/d	N/A
2	M	12	Facial dermatitis	Cutaneous small vessel vasculitis and undifferentiated juvenile idiopathic arthritis	2 pills/d	10
3	F	49	LLE cellulitis	Fibromyalgia, obesity, T2DM, HTN, central adrenal insufficiency	3 pills/d	5
4	F	61	Weight gain and generalized weakness	Osteoarthritis, asthma, hypothyroidism	2 pills/d	24
5	F	59	Cushingoid features	Well-differentiated bronchial carcinoid	N/A	4
6	F	64	Rapidly progressive CS	Pituitary CS	N/A	6
7	F	35	Exertional dyspnea and abdominal pain	Rheumatoid arthritis and pulmonary embolism	6 pills/d	36
8	M	52	Abdominal pain and weight loss	HTN, HLD, pre-DM, nonspecified arthritis	N/A	18
9	F	40	Intertrochanteric hip fracture	Obesity	6 pills/d	36
10	F	58	Persistent hyponatremia	N/A	3 pills/d	6-12
11	F	55	Worsening hypertension and weight gain	T2DM	N/A	N/A
12	M	59	Worsening glycemic control	T2DM	N/A	0.5
13[a]	F	46	Subtrochanteric femur fracture	HTN	8 pills/d	8
14[a]	F	66	Intertrochanteric femur fracture	HTN, HLD, T2DM	2 pills every other week, daily before admission	N/A
15[a]	F	21	Nausea and vomiting	N/A	6 pills/wk; 2 pills/d	30
16[a]	F	54	Back pain	T2DM, hepatic steatosis	1–2 pills/wk	12

CS, Cushing syndrome; HLD, hyperlipidemia; HTN, hypertension; LLE, left lower extremity; N/A, not applicable; T2DM, type 2 diabetes mellitus.
[a]Home institution patients.

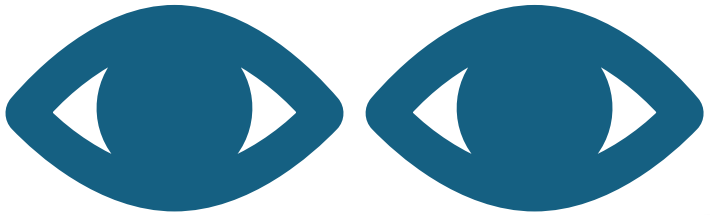
Chun M, et al. *South Med J.* **2025;118**:376–381.

Patient Characteristics

- Age ranged from 12 to 66 years
- Most patients (75%) had an underlying medical condition
- Of the 16 patients analyzed, 12 (75%) were diagnosed as having CS
- Three (18.75%) as having worsening hyperglycemia
- Average duration of Artri King use was 16.67 months to 13.35 months

Chun M, et al. *South Med J.* **2025;118**:376–381.

Invisible Exposure Visible Weakness:
A Case of Myopathy



Clinic Case

- A 49-year-old Mexican American male with HIV, presented to a Federally Qualified Health Center (FQHC) HIV clinic for a routine follow-up in December of 2023.

- **PMH:** hyperlipidemia, prediabetes, and chronic back pain.
- Symptoms at presentation included acute-on-chronic back pain and generalized body aches.

- **Active Medications Include:**
  - Atorvastatin 10mg daily
  - Biktarvy(Bictegravir 50mg/Emtricitabine200mg/TenofovirAlafenamide 25mg) daily
  - Omega-3 1 gram twice daily
  - Omeprazole 10mg daily
  - Venlafaxine 75mg daily

Additional Information

Lab Markers	12/05/2023 (PCP OV)	12/08/2023 (PCP OV)	01/17/2024 (HIV Clinic)	01/19/2024 (PCP Clinic)	08/2024 (HIV clinic)
Creatine Kinase (CK)	663 U/L	474 U/L		484U/L	119 U/L
AST	49 U/L	51 U/L	39 U/L		25 U/L
ALT	53 U/L	52 U/L	45 U/L		46 U/L
CBC	Normal	Normal		Normal	Normal
ESR, CRP	N/A	N/A		N/A	N/A
Renal Function	Normal	Normal		Normal	Normal
Lipids	N/A	TG: 354 mg/dL HDL: 28 mg/dL LDL: 42 mg/dL			TC:201 mg/dL TG: 296 mg/dL LDL: 111 mg/dL
Vitamin D	N/A	N/A		Normal	Normal

- **PCP suspected statin-induced myalgias, discontinued statin therapy, and informed the HIV provider for further evaluation.**
- **The HIV provider, after ruling out other potential medication-related causes for the patient's pain and body aches, consulted with a clinical pharmacist for additional insights.**
- **Upon further review, the clinical pharmacist discovered that the patient had been taking an over-the-counter (OTC) medication called Indarzona.**
- **Additional investigation revealed that the patient had been using Indarzona intermittently for the past five years.**

Case continued

- The long-term sporadic use of Indarzona, especially the dexamethasone component, raised concerns about steroid-induced myopathy as a potential cause of the patient's elevated CK levels and muscle pain.
- The Pharmacist counseled the patient on the risks of long-term steroid use, including muscle damage, bone loss, and adrenal suppression.
  - He was advised to taper off the Indarzona under medical supervision, which was planned during his follow up visit with the provider.

Glucocorticoid Induced Myopathy

- Potent fluorinated steroids (e.g., **dexamethasone, triamcinolone**)
- Predominantly **proximal muscles**
- The onset of symptoms is often insidious
- Difficulty rising from a seated position, climbing stairs, or performing activities requiring lower limb strength.
- High doses vs low doses

Minetto MA el al. *Muscle Nerve*. 2015;52(4):631-639.

Coutinho A el al. *Cureus*. 2023;15(11):e49548

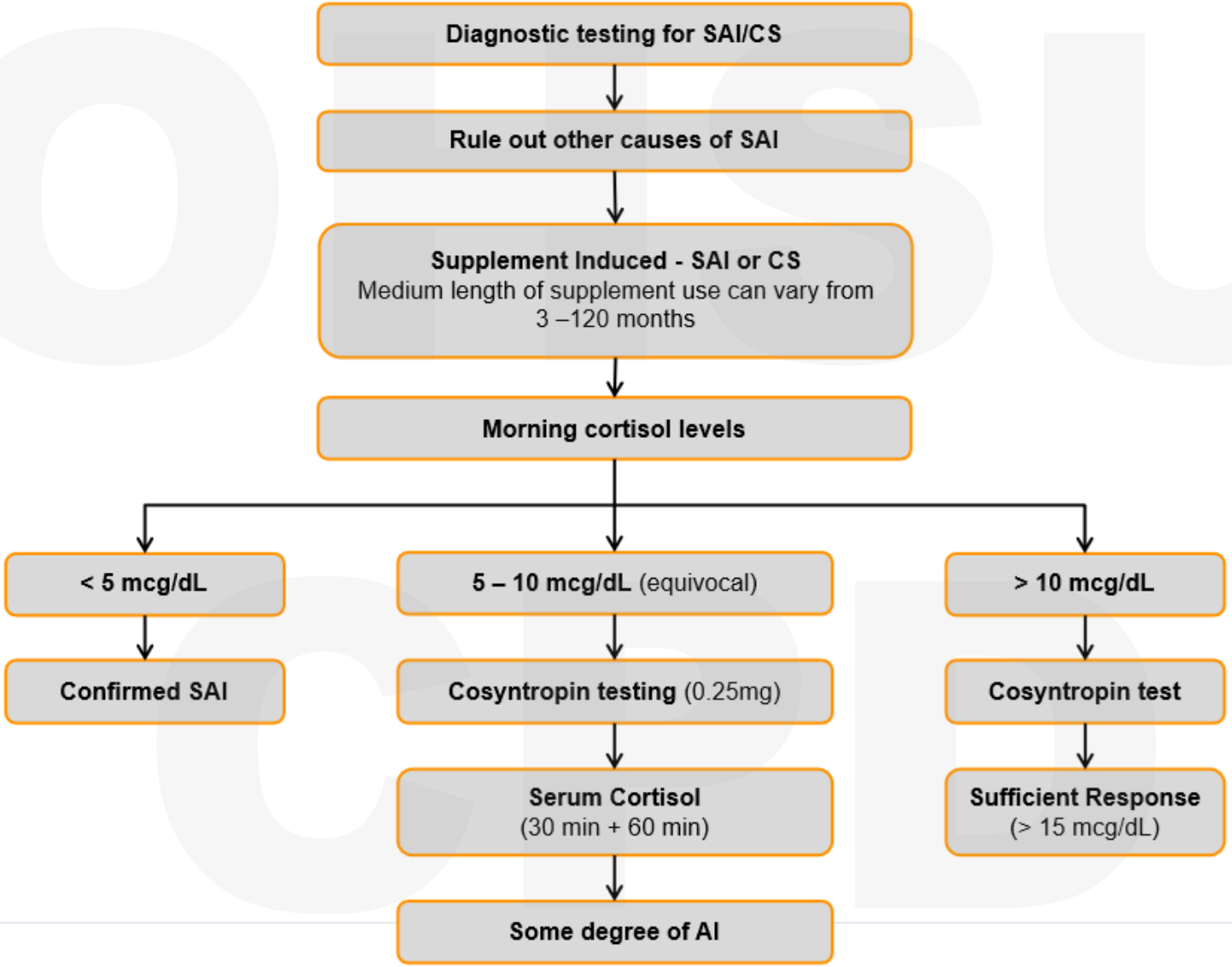
Comparison of Drug-Induced Myopathies: Glucocorticoids and Other Common Agents

Drug Class	Example Agents	Mechanism of Myopathy[1]	Clinical Presentation[2]	Lab Findings[3]	Recovery Timeline[4]
Glucocorticoids	Dexamethasone, Prednisone	Type II muscle fiber atrophy; catabolic muscle breakdown	Painless proximal muscle weakness (legs > arms)	Normal CK; ↑ CK in severe cases	Gradual ; improves within weeks to months (dose and duration dependent) with tapering
Statins	Atorvastatin, Simvastatin	Mitochondrial dysfunction; impaired membrane integrity	Myalgias, cramping, possible rhabdomyolysis	↑ CK common	Improves with discontinuation
Colchicine	Colchicine	Microtubule disruption; neuromuscular toxicity	Subacute weakness; may involve neuropathy	↑ CK; ↑ LFTs	Reversible within days to weeks
Antimalarials	Hydroxychloroquine*	Lysosomal dysfunction; impaired autophagic clearance	Chronic painless weakness; delayed recognition	Normal or mildly ↑ CK	May take weeks to months
Antiretrovirals	Zidovudine	Mitochondrial DNA polymerase inhibition	Diffuse fatigue and weakness	↑ CK	Variable; often improves when stopped

[1] Mechanisms are based on proposed or observed pharmacologic pathways and may vary with dose and duration.
[2] Presentation may overlap with underlying disease states; detailed clinical history is essential.
[3] CK = Creatine kinase; LFTs = Liver function tests.
[4] Timelines are general estimates and may vary by patient characteristics and comorbidities.

Diagnosis and Management Strategies

Diagnosis of Drug Induced Adrenal Insufficiency



Nachawi Net al. Cleve Clin J Med. 2024;91(4):245-255.

Management Strategies for Glucocorticoid Replacement & Tapering

- There is no consensus on the optimal glucocorticoid taper as this relies on several variables including duration, type and dose of the initial glucocorticoid course.
- Tapering off long term glucocorticoids can also present the challenge of glucocorticoid withdrawal syndrome.

Adrenal Insufficiency vs Glucocorticoid Withdrawal Syndrome

- **Adrenal Insufficiency (AI):**
  - ➢Hypotension
  - ➢Hyponatremia
  - ➢Hypoglycemia
  - ➢ Occurs with sub-physiologic glucocorticoid dosing
- **Glucocorticoid Withdrawal Syndrome:**
  - ➢ Symptoms may occur anytime during taper
  - ➢ Often around dose reduction
- **Common Withdrawal Symptoms After Hypercortisolism Surgery:**
  - ➢ Myalgias/arthralgias (50%)
  - ➢ Fatigue (45%), weakness (34%)
  - ➢ Sleep & mood changes
- Higher risk: Severe Cushing syndrome (67%) vs MACS (40%)

mild autonomous cortisol secretion (MACS)

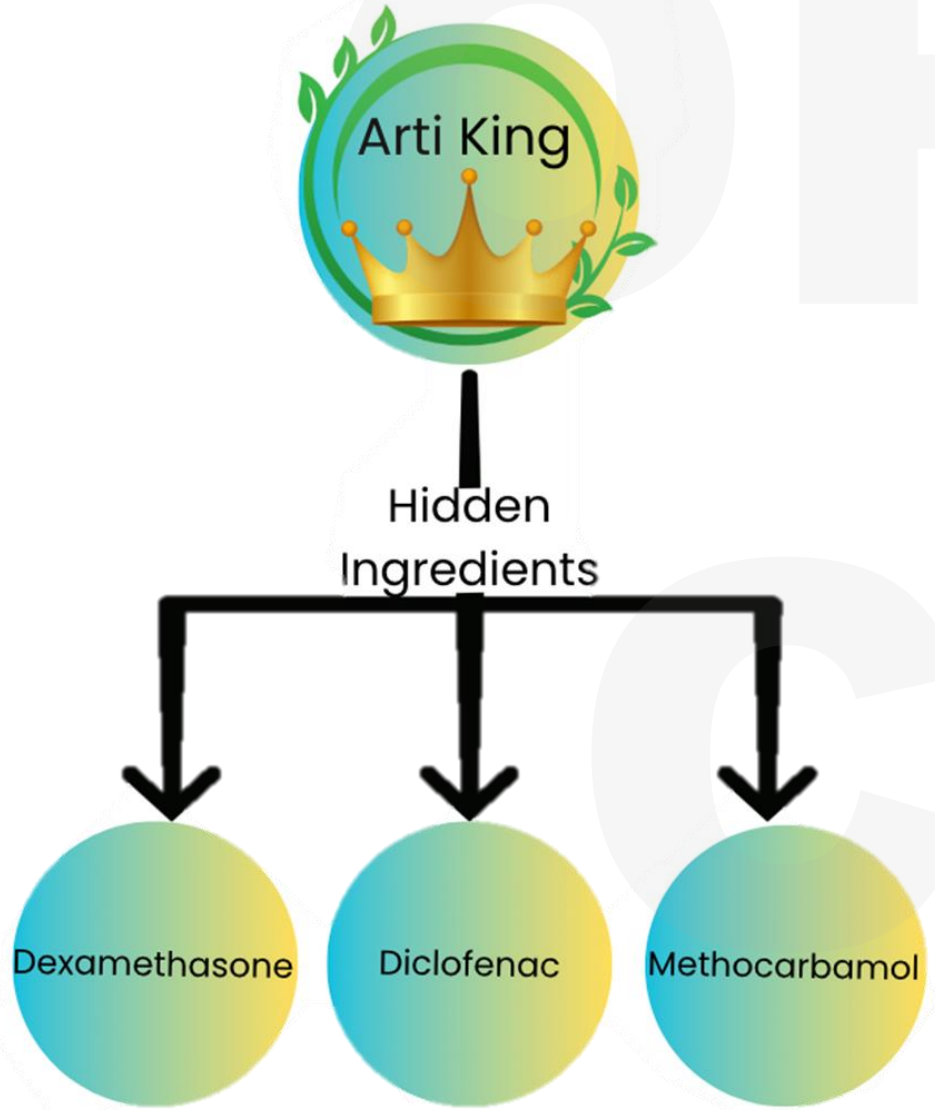
Hurtado MD et al. *Clin Endocrinol (Oxf)*. 2018;89(6):721-733

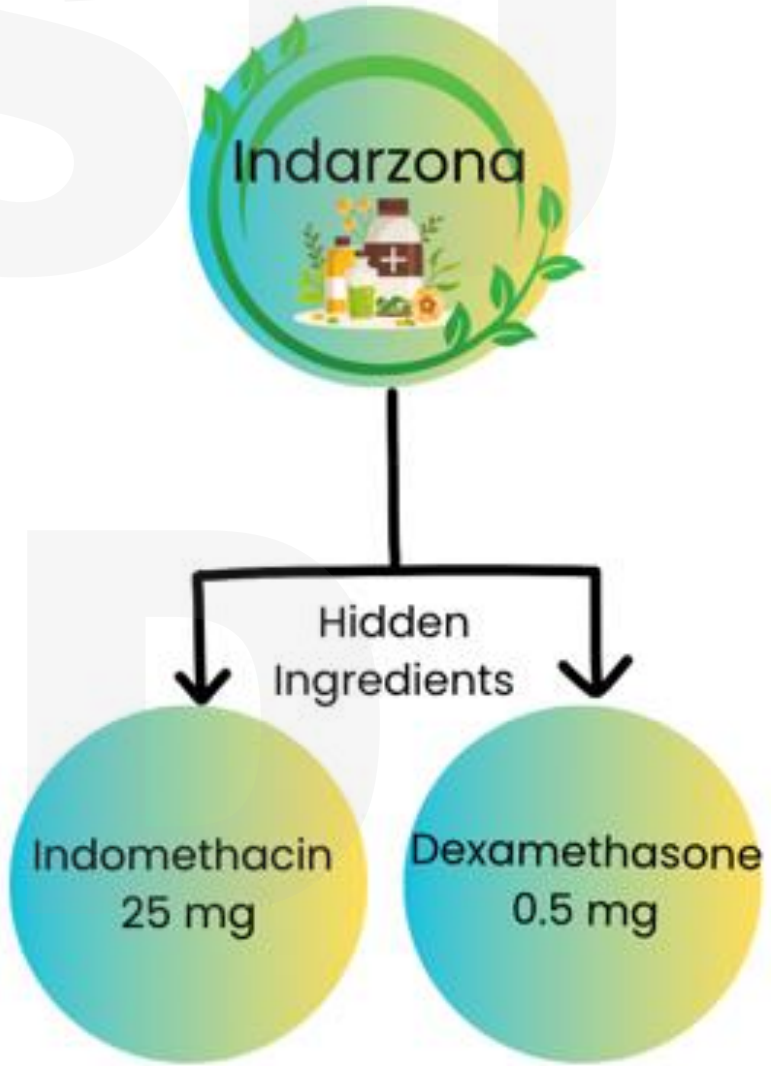
Nachawi N et al. Cleve Clin J Med. 2024 Apr 1;91(4):245-255

Starting total daily dose prednisone equivalent	Suggested tapering schedule
> 40 mg	Decrease by 5- 10 mg every week
20 to 40 mg	Decrease by 5 mg every week
10 to 20 mg	Decrease by 2.5 mg every 1-4 weeks
5 to 10 mg	Decrease by 1 mg every 1-4 weeks
5 mg	Transition to hydrocortisone 10mg twice daily. Decrease to 10mg in the morning and 5mg in the afternoon after 2-4 weeks. Thereafter, consider obtaining morning cortisol before hydrocortisone administration If SAI is confirmed, continue hydrocortisone 10mg in the morning and 5mg in the afternoon and repeat morning cortisol every 4 weeks until morning cortisol is >5. If cosyntropin testing shows an inadequate response continue lowest hydrocortisone dosing and repeat cosyntropin testing If the cosyntropin test shows a robust response hydrocortisone can be discontinued

Adapted from Beuschlein F et al. European Society of Endocrinology and Endocrine Society Joint Clinical Guideline: Diagnosis and therapy of glucocorticoid-induced adrenal insufficiency. Eur J Endocrinol. 2024;190(5):G25-G51. and Williams Textbook of Endocrinology 13th ed (2015)

Examples of “Natural Pain Medications”

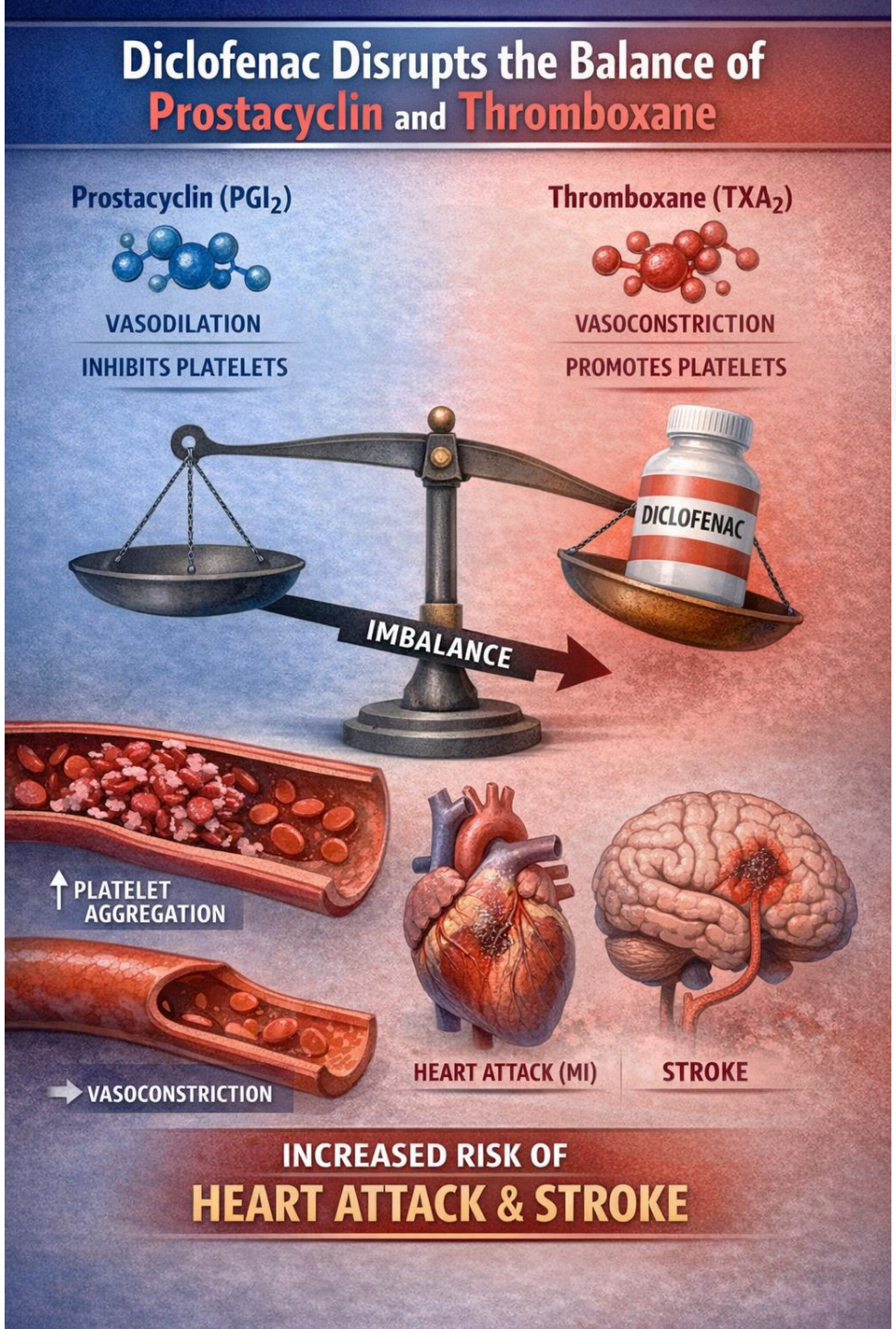




NSAIDs and CV Risk

- Individuals with CV diseases frequently have coexisting conditions such as osteoarthritis, rheumatoid arthritis, or other causes of acute or chronic pain that require treatment.
- Many of these individuals rely on OTC medications to manage their symptoms
- Cardiovascular risk is notably higher with certain NSAIDs, particularly diclofenac and celecoxib
- Diclofenac may cause gastrointestinal damage, renal complications, and hepatotoxicity, including liver damage, necrosis, or cholestatic hepatitis, similar to other NSAIDs
- Co-administration of NSAIDs with anticoagulants, especially warfarin, may further increase the risk of bleeding

Varas-Lorenzo C et al. Pharmacoepidemiol Drug Saf. 2013 Jun;22(6):559-70
Moore N. Drug Saf. 2020 Apr;43(4):301-318



- NSAIDs exert their effects by inhibiting cyclooxygenase (COX) enzymes—specifically COX-1 and COX-2.
- The degree of COX-2 selectivity and the potency of its inhibition are thought to play a role in the increased risk of MI linked to some NSAIDs

- Diclofenac is extensively metabolized in the liver, mainly by **CYP2C9 and CYP3A4**
- It's converted into **reactive quinone-imine and acyl-glucuronide metabolites**
- Covalently bind to hepatocyte proteins

OpenAI. *AI-generated illustration showing diclofenac disruption of prostacyclin–thromboxane balance and cardiovascular risk*. Generated using ChatGPT. 2026.

Khalil E. et al. Zagazig Univ Med J. 2025;31(1.1):56-61

FitzGerald GA. *Nat Rev Drug Discov*. 2003;2(11):879-890

Blobaum AL et al. J Med Chem. 2007;50(7):1425-1441

Complicated case

A 21-year-old female with no medical history presented to

The ED with nausea, vomiting, and poo oral intake for 3 weeks.

Labs: Na 127, K 3.4, Scr 2.21, BUN 85, Glucose 139

alkaline phosphatase (ALP) 119, aspartate aminotransferase (AST) 651, alanine aminotransferase(ALT) 250.

AKI and elevated transaminases, A complete blood count revealed pancytopenia, bilateral erythematous periorbital rash.

Medications :Taking Artri King for Joint pain two to three times per week

for 1 year before completely stopping the medication 3 weeks before admission

Diagnosis: systemic lupus erythematosus/SS overlap syndrome and autoimmune hepatitis

Chun M, et al. *South Med J.* **2025;118**:376–381.

Case Continued

- Another hidden ingredient of Artri King is diclofenac, caused nephrotoxicity and hepatotoxicity.
- She was discharged on prednisone, hydroxychloroquine ,and mycophenolate.
- She followed up within 2 weeks for steroid tapering, with normal liver and renal function by 2 months.

Khalil E. et al. Zagazig Univ Med J. 2025;31(1.1):56-61

Chun M, et al. *South Med J.* **2025;118**:376–381.

Lack of Awareness of Cardiovascular Contraindications in Diclofenac Prescribing

- A study reported that over one in ten patients who have newly prescribed diclofenac had contraindications, exposing them to potential CV risks when safer alternative treatments can be an option.
- Since 2020 diclofenac is available as an OTC gel in the USA. Despite regulatory restrictions, diclofenac remains the most widely used OTC pain reliever.
- Given that Artri King and related supplements contain undeclared diclofenac, healthcare providers should exercise increased vigilance in patients at high CV risk and hepatotoxicity
- Providers engage in open dialogue to assess the use of OTC pain medications

Scholle O et al. *J Intern Med*. 2020;287(2):171-179.

Methocarbamol

- Centrally acting skeletal muscle relaxant
- It has been associated
- Neurologic effects

  such as dizziness, falls, seizures, sedation
- gastrointestinal effects, and gastritis

Supplements Containing Undeclared Pharmaceuticals and Associated Harms

[a] Marketed as "natural" or herbal ingredients listed on packaging or online retail platforms.

[b] Active pharmaceutical ingredients confirmed via FDA laboratory analyses but not disclosed on product labels

[c] Risks are based on pharmacologic profiles and reported adverse events.

Abbreviations: CV = Cardiovascular; SAI = Secondary adrenal insufficiency, MSM = methylsulfonylmethane

Table 1 – Developed and adapted from References 6-26

Brand Name(s)	Marketed Ingredients[1]	Undeclared Pharmaceutical Ingredients[2]	Reported or Theoretical Risks[3]
Artri King[a, b]	Glucosamine, chondroitin, collagen, turmeric, nettle, omega-3 fatty acids, methylsulfonylmethane (MSM)	Dexamethasone, diclofenac, phenolphthalein	Secondary adrenal insufficiency (SAI), iatrogenic Cushing syndrome, CV events, gastrointestinal bleeding, hepatotoxicity
Artri Ajo King[a, c]	Garlic extract, herbal blend, glucosamine, turmeric, collagen, omega 3, calcium carbonate, microcrystalline cellulose, chamomile	Diclofenac	CV events, gastrointestinal bleeding, hepatotoxicity
AK Forte[e, f]	Vitamin C, glucosamine, chondroitin, collagen, vitamin C, turmeric, nettle, omega-3 fatty acid, MSM	Dexamethasone, diclofenac, methocarbamol	SAI, myopathy, sedation, CV events, dizziness, low blood pressure, hepatotoxicity, iatrogenic Cushing syndrome
Kuka Flex Forte[d, g]	Omega-3, glucosamine HCl, chondroitin sulfate, MSM, hyaluronic acid, thuja, ginger, willow bark, aloe vera, green tea, devil's claw	Diclofenac	CV events, gastrointestinal bleeding, hepatotoxicity
Reumo Flex[k]	willow, hyaluronic acid, devil's claw, ginger, glucosamine, aloe vera, chondroitin , omega-3	Diclofenac	CV events, gastrointestinal bleeding, hepatotoxicity
Artri King Reforzado con Ortiga y Omega-3[a]	Nettle, omega-3 fatty acids, glucosamine, chondroitin, collagen, vitamin C, turmeric, MSM	Diclofenac, dexamethasone	SAI, CV events, gastrointestinal bleeding, weight gain, hepatotoxicity, iatrogenic Cushing syndrome
Umary[h, i]	Hyaluronic acid, collagen type II, hydrolyzate, cumcuma root, turmeric, glucosamine sulfate, chondroitin sulfate, MSM, keratin, Mg oxide, CaCO3, Vitamin C, Vitamin E, excipients	Diclofenac, omeprazole	SAI, gastrointestinal bleeding, diarrhea, nausea, headache, cardiovascular and serious skin reactions, hepatotoxicity
Ardosons[j]		Indomethacin 25/ Betamethasone 0.75/ Methocarbamol 215mg	Gastrointestinal bleeding, sedation, dizziness, headache

Implications for clinicians

- Early Identification and Diagnosis
- An unexplained Cushing's syndrome, sudden adrenal crisis, or refractory diabetes in a patient using imported "remedios" warrants testing for exogenous steroids.
- Close collaboration between pharmacists and providers is vital: pharmacists can alert physicians to suspicious supplements, and physicians can order confirmatory tests or evaluations

Patient Counseling and Education

- The reasons underlying the observed symptomatic improvement following supplement use.
- The serious adverse health effects linked to the supplement's concealed ingredients, particularly adrenal suppression and hyperglycemia.
- The clinical importance of gradual discontinuation rather than abrupt cessation of the product.
- Framing the discussion around patient safety (e.g., "my goal is to protect you from harm") rather than criticizing the use of traditional or folk remedies is more likely to be effective.
- 8 of 12 interviewed patients discontinued the adulterated supplement after their physician explained the associated risks, highlighting the effectiveness of targeted counseling

Nguyen VD et al. Cureus. 2025 Jul 20;17(7):e88378

Public Health Advocacy

- Regulatory agencies such as the U.S. Food and Drug Administration (FDA) typically intervene only after adverse events are reported
- Even when regulatory action is taken, enforcement remains challenging, as products may be reformulated, rebranded, or distributed through informal or cross-border channels.
- Professional organizations may further amplify these efforts by collaborating on culturally tailored patient education campaigns within affected communities, emphasizing the risks associated with “too-good-to-be-true” remedies.

QUESTIONS