

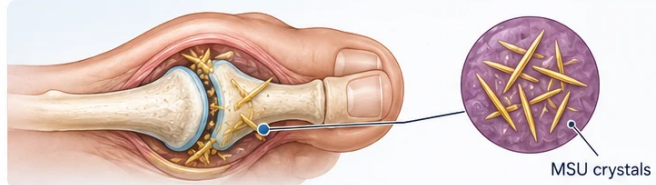
How Uric Acid Crystals Cause a Gout Attack

A gout flare is not simply “high uric acid” — it is an acute inflammatory response triggered when monosodium urate (MSU) crystals are recognized by immune cells in the joint fluid.

1

Uric acid accumulates and crystals form

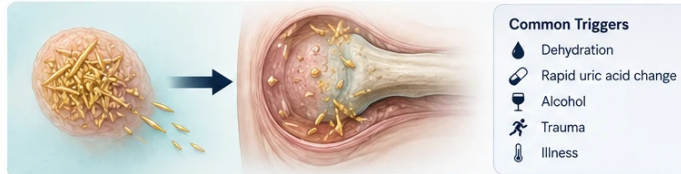
When serum uric acid exceeds 6.8 mg/dL chronically, MSU crystals begin forming in cartilage, tendons, and joint fluid — particularly in cooler peripheral joints (big toe, ankle, knee) where lower temperature promotes crystallization.



2

A trigger dislodges crystals into the joint space

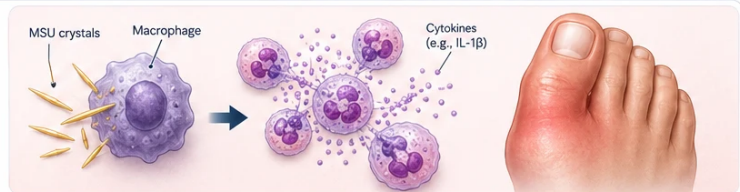
Triggers include dehydration, rapid uric acid change (starting or stopping allopurinol), alcohol, trauma, or illness. Crystals shed from deposits into the joint fluid, where immune cells encounter them.



3

Neutrophils engulf crystals — explosive inflammation

Macrophages recognize MSU crystals as foreign via the NLRP3 inflammasome, releasing IL-1 β and other cytokines. This triggers a massive neutrophil influx — causing the intense swelling, heat, redness, and excruciating pain of an acute gout attack within hours.



4

The attack resolves — but crystals remain

Without treatment, the inflammation subsides over 7–14 days. But crystals remain deposited in the joint. Each subsequent attack causes more damage, and the intervals between attacks shorten over time.



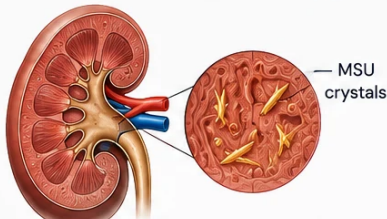
KIDNEY IMPACT

How Gout Damages the Kidneys

The kidney–gout relationship is bidirectional: elevated uric acid damages kidneys, and reduced kidney function raises uric acid. This vicious cycle must be broken with targeted therapy.

1 Urate nephropathy

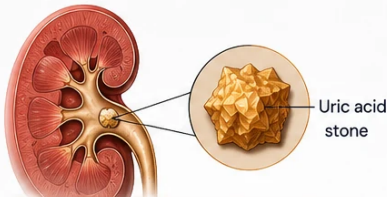
MSU crystals deposit in renal tubules and interstitium, causing chronic inflammation and fibrosis. This is a direct cause of CKD progression independent of blood pressure and diabetes — and is often underdiagnosed.



Leads to chronic inflammation, fibrosis, and CKD progression

2 Uric acid kidney stones

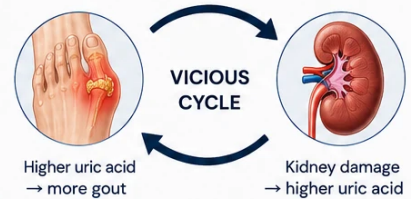
Supersaturated uric acid in acidic urine precipitates as stones. Risk is highest in patients with metabolic syndrome, low urine pH, and low fluid intake. These cause severe flank pain and can obstruct urine flow, causing acute kidney injury.



Can obstruct urine flow and cause acute kidney injury

3 CKD raises uric acid further

As kidney function declines, uric acid excretion decreases — making hyperuricemia worse. Patients with CKD Stage 3–5 almost universally have elevated uric acid, creating a compounding cycle of joint and kidney damage.



Uric acid target in CKD patients

For patients with both CKD and gout, the uric acid target is <6.0 mg/dL (KDIGO 2024). Febuxostat 80 mg once daily is preferred over allopurinol in most Filipino CKD patients — it does not require dose adjustment until eGFR falls below 15, unlike allopurinol which must be carefully reduced as kidney function declines.



What to Eat — and What Triggers Flares

Diet alone cannot normalize uric acid in most patients with established gout, but it significantly reduces flare frequency and supports medication effectiveness. In Filipino patients, the biggest dietary drivers are organ meats, shellfish, beer, and softdrinks with fructose.

! Always avoid — high flare risk

-  Organ meats: liver, kidney, brain, intestines (goto, dinuguan)
-  Beer and spirits (especially dark beer and gin)
-  Sardines, anchovies, mackerel (high-purine fish)
-  Softdrinks with high-fructose corn syrup (regular Coke, Sprite)
-  Sugary fruit juices (fructose raises uric acid independently of purines)
-  Bagoong, shrimp paste, fermented fish products

✓ Safe — eat freely

-  Eggs (very low purine — excellent protein source)
-  Low-fat dairy: milk, yogurt (actually lowers uric acid)
-  Most vegetables including camote, kangkong, pechay
-  White rice, bread, pasta, corn
-  Coffee (associated with lower uric acid levels)
-  Water — aim for 2–3 liters daily to promote uric acid excretion
-  Cherries and tart cherry juice (modest anti-inflammatory effect)

⚖ Moderate — limit portions

-  Red meat (beef, pork): maximum 1 serving/day
-  Shellfish (tahong, halaaan, hipon): once or twice weekly
-  Bangus and tilapia: moderate portions acceptable
-  Tofu and legumes (mongo, tokwa): small-to-moderate portions despite purines — overall effect is neutral or beneficial
-  Wine: one glass with a meal is much less harmful than beer

✓ Protective foods — include regularly

-  Low-fat milk and yogurt (increases uric acid excretion)
-  Vitamin C-rich foods: calamansi, guava, papaya (mild uricosuric effect)
-  Ampalaya (bitter melon) — modest xanthine oxidase inhibition
-  Adequate hydration — the single most impactful dietary measure
-  Alkaline foods (vegetables, fruits) — raise urine pH, reduce stone risk



Key takeaway: Focus on whole foods, healthy portions, and hydration. Combine with proper medications for optimal gout control.



Hydrate



Watch portions



Eat balanced



Take meds

DAILY PURINE TARGET: <400 mg/day (gout) | <200 mg/day (severe or tophaceous gout)

Plant-based purines (vegetables, beans) DO NOT raise flare risk — animal-derived purines do.

Source: FNRI-Philippines. USDA. ACR 2020. KDIGO 2024. Values are approximate per typical Filipino serving.

Food Item (Filipino / English)	Serving	Purines	mg/day target	Risk
ORGAN MEATS (LAMAN-LOOB) — single biggest risk category; avoid entirely				
Sweetbreads (thymus/pancreas)	100g	~825	206%	EXTREME
Atay ng baka / beef liver	100g	~550	138%	EXTREME
Bato ng baka / beef kidney	100g	~510	127%	EXTREME
Dinuguan (pork blood stew)	1 cup	~480	120%	EXTREME
Atay ng manok / chicken liver	100g	~470	118%	EXTREME
Goto / tripe (callos)	100g	~470	118%	EXTREME
Utak / brain	100g	~360	90%	EXTREME
Kasim / balun-balunan / gizzard	100g	~280	70%	EXTREME
Isaw ng manok / chicken intestines	2 sticks (~50g)	~250	62%	EXTREME
Bituka ng baboy / pork intestines	100g	~230	57%	VERY HIGH
Betamax (pork/chicken blood)	1 stick (~50g)	~190	48%	VERY HIGH
Puso ng manok / chicken heart	100g	~170	42%	HIGH
SEAFOOD & FISH — small fish, shellfish, dried/fermented = highest risk				
Sardinas (canned, with bones)	1/2 can (100g)	~480	120%	EXTREME
Dilis / dried anchovies (bilad)	30g	~340	85%	EXTREME
Tuyo / dried salted fish	30g	~290	72%	EXTREME
Bagoong alamang / shrimp paste	1 tbsp (15g)	~250	62%	EXTREME
Tahong / green mussels	100g	~290	72%	EXTREME
Talaba / oysters	100g	~290	72%	EXTREME
Tuna (fresh, grilled)	100g	~290	72%	EXTREME
Hipon / sugpo / shrimp, prawns	100g	~265	66%	VERY HIGH
Galunggong / mackerel scad	100g	~250	62%	VERY HIGH
Bagoong isda / fermented fish paste	1 tbsp (15g)	~220	55%	VERY HIGH
Hibe / dried small shrimp	1 tbsp (10g)	~200	50%	VERY HIGH
Pusit / squid	100g	~190	48%	HIGH
Alimasag / alimango / crab	100g	~150	38%	HIGH
Bangus / milkfish (fresh, grilled)	100g	~165	41%	HIGH
Tilapia (grilled)	100g	~120	30%	MODERATE
Cream dory / pangasius	100g	~95	24%	MODERATE
MEAT, POULTRY & PROCESSED MEATS				
Lechon kawali / liempo (pork belly)	100g	~145	36%	HIGH
Adobong manok / chicken adobo	100g	~140	35%	HIGH
Beef brisket / tapa / karne	100g	~135	34%	HIGH
Chicken breast, boiled (no skin)	100g	~135	34%	HIGH
Tocino / longganisa / hotdog	100g	~110	28%	HIGH
Spam / corned beef (canned)	100g	~110	28%	HIGH
Pork shoulder / kasim (inihaw)	100g	~130	32%	HIGH

OUT & URIC ACID IN CKD — SAFE & MODERATE PURINE FOODS + COMPLETE MEAL GUID

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GREEN (SAFE) < 50 mg/serving | TEAL (LOW) 50-100 mg | AMBER (MODERATE) 100-200 mg

Plant-based purines do NOT raise flare risk in modern studies. Prioritize eliminating organ meats, shellfish, beer, and HFCS drinks.

Food Item (Filipino / English)	Serving	Purines mg/day target	Risk
VEGETABLES & LEGUMES — safe despite measurable purines (plant purines ≠ flare risk)			
Upo / bottle gourd	1 cup cooked	~5 ↓	1% SAFE
Sayote / chayote	1 cup cooked	~10 ↓	2% SAFE
Repolyo / cabbage	1 cup cooked	~12 ↓	3% SAFE
Talong / eggplant	1 cup cooked	~14 ↓	4% SAFE
Labanos / white radish	1 cup cooked	~15 ↓	4% SAFE
Kamatis / tomato	1 medium	~15 ↓	4% SAFE
Pipino / cucumber	1 cup	~10 ↓	2% SAFE
Kangkong (boiled, water discarded)	1 cup cooked	~40 ●	10% SAFE
Pechay / bok choy	1 cup cooked	~30 ●	8% SAFE
Ampalaya / bitter melon	1 cup cooked	~35 ●	9% SAFE
Kalabasa / squash	1 cup cooked	~75 ●	19% SAFE
Asparagus	1 cup cooked	~75 ●	19% SAFE
Kabute / mushroom (fresh)	1 cup cooked	~90 ●	22% SAFE
Spinach / alugbati	1 cup cooked	~60 ●	15% SAFE
Malunggay / moringa	1/2 cup cooked	~55 ●	14% SAFE
Munggo / mung beans (cooked)	1 cup	~135 ●	34% MODERATE
Garbanzos / chickpeas (cooked)	1/2 cup	~85 ●	21% SAFE
Tokwa / tofu (firm)	100g	~70 ●	18% SAFE
GRAINS, EGGS, DAIRY & FRUITS — foundation of a gout-friendly diet			
Kanin / white rice (1 cup)	1 cup cooked	~10 ↓	2% SAFE
Pandesal / white bread	2 pieces	~12 ↓	3% SAFE
Bihon / rice noodles	1 cup cooked	~10 ↓	2% SAFE
Pasta / macaroni (cooked)	1 cup cooked	~15 ↓	4% SAFE
Mais / corn (boiled)	1 ear	~45 ●	11% SAFE
Itlog / whole egg	1 large	~5 ↓	1% SAFE
Puti ng itlog / egg white	2 whites	~2 ↓	0% SAFE
Gatas / low-fat milk	1 cup (240mL)	~15 ↓	4% SAFE
Yogurt (plain, low-fat)	1 cup	~20 ↓	5% SAFE
Mansanas / apple	1 medium	~9 ↓	2% SAFE
Peras / pear	1 medium	~8 ↓	2% SAFE
Papaya (ripe)	1 cup	~8 ↓	2% SAFE
Saging / banana	1 medium	~8 ↓	2% SAFE
Seresa / cherries (fresh)	10-12 pieces	~5 ↓	1% PROTECTIVE
Calamansi (fruit)	3-5 pieces	~4 ↓	1% PROTECTIVE
BEVERAGES — beer and HFCS drinks are the biggest hidden drivers			
Beer (any / lahat ng klase)	1 bottle (330mL)	Doubles flare risk	Doubles EXTREME
Gin / lambanog / brandy / whiskey	1 shot (45mL)	Blocks UA excretion	Blocks U EXTREME
Coke / Pepsi / Royal (HFCS)	1 can (330mL)	+0.3-0.5 mg/dL UA	+0.3-0.5 EXTREME
Softdrink kahit anong klase	500mL bottle	HFCS → urate	HFCS → VERY HIGH
Sweetened milk-tea / frappuccino	1 large (500mL)	Fructose + sugar	Fructose HIGH
Tang / Zest-O / powdered juices	1 glass	Concentrated fructose	Concent HIGH
Fruit smoothie (mango/banana)	1 cup	Natural fructose	Natural f MODERATE
Wine (red or white)	1 small glass	Less than beer/spirits	Less tha MODERATE
Sports drink (Gatorade, Pocari)	500mL bottle	Sugar raises urate	Sugar ra MODERATE
Brewed coffee (black)	1-3 cups/day	Lowers UA long-term	Lowers U PROTECTIVE
Plain water	2.5-3 L/day	Improves excretion	Improve PROTECTIVE
Low-fat milk / plain yogurt	1 cup	Lowers UA (orotic acid)	Lowers U PROTECTIVE
Calamansi juice (unsweetened)	1 glass	Vitamin C → mild uricosuric	Vitamin PROTECTIVE uric
Tart cherry juice (unsweetened)	1/2 cup	Anti-inflammatory	Anti-infl PROTECTIVE

GOUT & URIC ACID IN CKD — HIDDEN TRIGGERS, MEDICATIONS & FLARE MANAGEMENT

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HIDDEN URIC ACID DRIVERS IN FILIPINO FOOD & DAILY LIFE

HFCS Softdrinks (biggest hidden trigger):

Coke, Pepsi, Royal, Sprite, sweetened iced teas, energy drinks, store-bought milk-tea, Tang, Zest-O. HFCS → fructose → direct uric acid synthesis in liver. One 500mL bottle raises UA by 0.3-0.5 mg/dL within hours — enough to trigger a flare.

Hidden seafood & bagoong:

Bagoong alamang/isda in kare-kare, pinakbet, dipping sauce. Patis as finishing sauce. Hibe/dried shrimp in lugaw, palabok, tikoy. Sardines/anchovies in pasta. Anchovy paste hidden in Worcestershire sauce, Maggi seasoning, oyster sauce. Knorr/Maggi bouillon cubes =

Cooking broth (sabaw) trap:

Purines leach from bones and meat into the broth of nilaga, sinigang, bulalo, bone broth. Eat the meat in measured portions. SKIP THE BROTH entirely. The broth of bulalo is one of the highest-purine liquids in Filipino cooking.

Medications that raise uric acid:

Thiazide diuretics (HCTZ in Co-Diovan, Co-Aprovel) — #1 drug-induced gout cause. Loop diuretics (furosemide, torsemide). Low-dose aspirin 81mg. Cyclosporine/tacrolimus (transplant). Niacin (high-dose). Beta-blockers (metoprolol, atenolol). Do NOT stop cardiac meds without

Dehydration & lifestyle traps:

Heat, El Niño conditions, gym sessions, food poisoning; any rapid dehydration can trigger within 24h. Crash diets, fasting, ketogenic diets: ketone competition for UA excretion. Big blowout meals (hoodle fight, lechon party): days' worth of purines at once. Weekend binge drinking:

MEDICATIONS FOR GOUT — FLARE TREATMENT VS. LONG-TERM PREVENTION

Medication	Purpose	CKD Notes	Local Name (PH)
Febuxostat 80mg OD	Long-term UA lowering (preferred in CKD)	Dose adjustment until eGFR <15. Take daily. No uric aciduria.	Fely NC, Uric free, Agetaex
Allopurinol 100-300mg	Long-term UA lowering (alternative)	Dose-reduce in CKD. Check HLA-B*5801 first (Genipia) to avoid skin reaction risk.	Genipia, Uric free
Colchicine 0.5mg	Flare treatment + prophylaxis when starting ULT	Reduce dose if within 12-24h. Reduce dose if on statins.	Colky, Agenticol, Colchicine
Prednisone / Methylpred	Acute flare (when NSAIDs contraindicated)	Avoid in CKD, elderly, or PUD. Short course.	Generic, Pred, Msoiler
Naproxen / Indomethacin	Acute flare ONLY (NOT for CKD patients)	Avoid in CKD, heart failure, or peptic ulcer	Generic, NSAIDs

DO NOT start febuxostat/allopurinol during an active flare — wait until fully resolved (2-4 weeks).

When starting ULT: prescribe colchicine 0.5mg OD for 3-6 months to prevent paradoxical flares (crystal mobilization).

WHAT TO DO DURING A GOUT ATTACK — 4-STEP PROTOCOL

- 1 Act within 12-24 hours:** Start anti-inflammatory medication IMMEDIATELY at first sign. Colchicine or prednisone (from your doctor's rescue kit). Do NOT
- 2 Rest & ice:** Rest the affected joint. Elevate it above heart level. Apply ice wrapped in towel for 20-30 min, several times daily. Even bedsheets pressure o
- 3 Drink 3 liters of water today:** Flush uric acid through the kidneys. Avoid alcohol completely. Avoid HFCS drinks and sweet juices. Plain water, black co
- 4 Do NOT stop your febuxostat/allopurinol:** Stopping and restarting ULT causes uric acid fluctuations that prolong the current flare and trigger additio

SMART SWAPS — HIGH-PURINE → LOWER-PURINE FILIPINO ALTERNATIVES

Sisig / atay (organ meat)	Grilled tuna (limit) or tofu sisig (tokwa-based) + egg
Dinuguan	Ginisang upo + pork shoulder (small serving, boiled, broth discarded)
Sardinas / dilis (snack)	Hard-boiled egg or tofu with calamansi + a little toyo
Bagoong in kare-kare	Miso paste (1 tsp) + calamansi — far lower purine, similar umami
Beer (after work)	Ice-cold black coffee / iced unsweetened calamansi juice / sparkling water
Coke / Pepsi with meals	Plain water + calamansi or brewed unsweetened tea
Bulalo broth / bone broth	Eat only the boiled beef (limited serving); skip all broth entirely
Kare-kare with bagnet + bagoong	Nilaga (boiled beef, no broth) + miso sauce instead of bagoong
Goto / goto-goto (organ-based)	Lugaw (plain rice porridge) with egg + ginger + no organ meats
Inihaw na bangus (whole portion)	Half portion (50-70g) tilapia or cream dory boiled + vegetables
Weekend beer-drinking session	One small glass of red wine maximum, with food; 2L water throughout day

THE FILIPINO "FLARE DAY" PATTERN — From the guide:

Saturday: beer + sisig + chicharon → Sunday: kare-kare + bagoong + lechon + softdrinks + isaw → dehydrated sleep

Monday 3AM: big toe on fire. THREE FIXES prevent 80% of these: stop softdrinks, stop beer, drink 2-3L water on weekends.

Full guide with UA calculator, FEUA tool, FAQ, medication guide & flare protocol:

williamriveromd.com/guides/gout-uric-acid.html