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Reports
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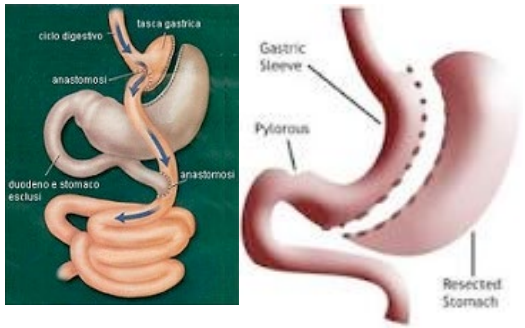


Table 2 Postoperative nutritional supplementation and monitoring for patients who have bariatric surgery, based on Parrott et al. [3]

Vitamins and minerals	Routine preventive supplementation	Deficiency treatment	Monitor
Thiamine	12 mg/day (d)	Repletion may be by: oral therapy—100 mg 2–3 times/day iv therapy—200 mg 3 times/day IM therapy—250 mg once daily for 3 to 5 days	Treat immediately if the patient has prolonged episode of dysphagia, vomiting, poor dietary intake, or fast weight loss. Do not wait for confirmation of deficiency by laboratory tests
Vitamin B12	350–500 μg/day or 1000 μg intramuscularly monthly (IM)	1000 μg/day IM to achieve normal levels	Screen every 3 months in first year post surgery and then at least annually or as clinically indicated. Treat immediately if deficiency detected
Folic acid	400–800 μg/day	1000 μg/day Check for vitamin 12 deficiency first	Screen within 3 months of surgery, then every 3 to 6 months until 12 months and then annually. Give attention to female patients of childbearing age
Iron	Males: 18 mg/day Fertile females: 45–60 mg/day	150–300 mg (2–3 times)/day Use IV supplementation if does not resolve	Screen within 3 months of surgery, then every 3 to 6 months until 12 months and then annually
Vitamin D	3000 IU/day To maintain 25(OH) vit D > 30 ng/mL	6000 IU/day or 50,000 IU 1 to 3 times/week	Screen within 3 months of surgery, then every 3 to 6 months until 12 months and then annually
Calcium	BPD/DS: 1800–2400 mg/day AGB/SG/RYGB: 1200–1500 mg/day	Check PTH (< 30 ng/dL) and vitamin D (>30 ng/dL)	Monitor PTH at baseline to exclude primary hyperparathyroidism
Vitamin A	AGB: 5000 IU/day RYGB/SG: 5000–10,000 IU/day BPD/DS: 10,000 UI/day	10,000–25,000 IU/day until clinical improvement (1–2 weeks). IM injections may be needed if no improvement	Screen in first year following RYGB and OAGB. Screen within 3 months of surgery, then every 3 to 6 months until 12 months and then annually following BPD/DS and SADIs
Vitamin E	15 m/day	100–400 IU/day	Screen at least annually in BPD/DS and SADIs. Screen in unexplained anaemia or neuropathy
Vitamin K	AGB: 90-120 μg/day SG/RYGB: 90–120 μg/day BPD/DS: 300 μg/day	10 mg parenterally in acute malabsorption 1–2 mg/day orally or 1–2 mg/week parenterally in chronic malabsorption	Screen at least annually in BPD/DS and SADIs or where there is established fat soluble vitamin deficiency
Zinc	AGB/SG: 8–11 mg/day RYGB: 8-22 mg/day BPD/DS: 16-22 mg/day	No recommended amount for treatment of deficiency. Monitor copper to avoid zinc induced copper deficiency. Supplementation with 1 mg copper is recommended for every 8–15 mg of elemental zinc to prevent copper deficiency	Screen at least annually especially in RYGB, BPD/DS, OAGB, and SADIs
Copper	AGB/SG: 1 mg/day RYGB/BPD/DS: 2 mg/day	3 – 8 mg/day oral copper gluconate or sulphate. Monitor zinc	Screen at least annually especially in RYGB, BPD/DS, OAGB, and SADIs

These recommendations are based on ASMBS guidelines. Please note that recommendations vary between different national guidelines

AGB, adjustable gastric band; SG, sleeve gastrectomy; RYGB, Roux-en-Y gastric bypass; OAGB, one anastomosis gastric bypass; SADIs, single anastomosis duodenal-Ileal bypass with sleeve gastrectomy; PTH, parathyroid Hormone

For OAGB and SADIs, follow recommendations for BPD/DS

Causes of macro- and micronutrient deficiencies in cancer.

2015

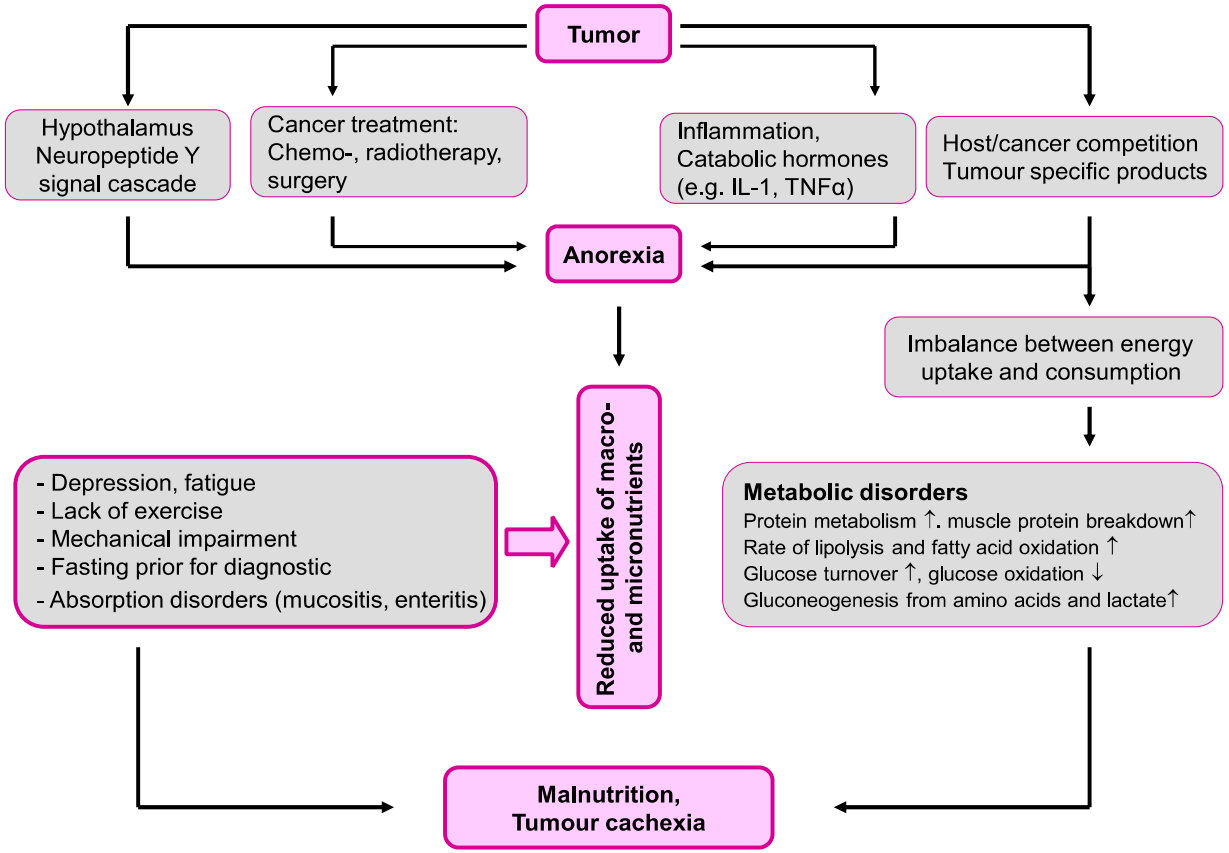


Table 2. Specific chemotherapy-induced micronutrient imbalance (selection) [4].

Cytostatic Agent	Micro-nutrient	Mechanism	Possible Consequences
Cisplatin	L-carnitine	Increased renal excretion of L-carnitine	Cisplatin-induced carnitine insufficiency, increased risk of complications (e.g., fatigue)
Cisplatin	Magnesium, potassium	Increased renal excretion of magnesium and potassium	Hypomagnesaemia, hypokalaemia, disorders of lipid metabolism, glucose intolerance, increased nephrotoxicity
Cyclo-phosphamide	Vitamin D	Increased breakdown of calcidiol and calcitriol to inactive metabolites by 24-hydroxylase	Vitamin D deficiency (calcidiol <20 ng/mL), risk of metabolic bone disorders and impaired immunocompetence
Fluorouracil	Vitamin B1	Inhibition of phosphorylation of thiamine to active coenzyme thiamine diphosphate	Risk of cardiac failure, lactic acidosis, neurotoxicity
Ifosfamide	L-carnitine	Increased renal excretion of L-carnitine	Ifosfamide-induced carnitine insufficiency, increased risk of complications (e.g., fatigue)
Methotrexate	Folic acid	Folic acid antagonism	Folate deficiency, homocysteinaemia, mucositis
Paclitaxel	Vitamin D	Increased breakdown of calcidiol and calcitriol to inactive metabolites by 24-hydroxylase	Vitamin D deficiency (calcidiol <20 ng/mL), risk of metabolic bone disorders and impaired immunocompetence
Pemetrexed	Folic acid	Folic acid antagonism	Mucositis, diarrhea, thrombocytopenia, neutropenia, homocysteinaemia

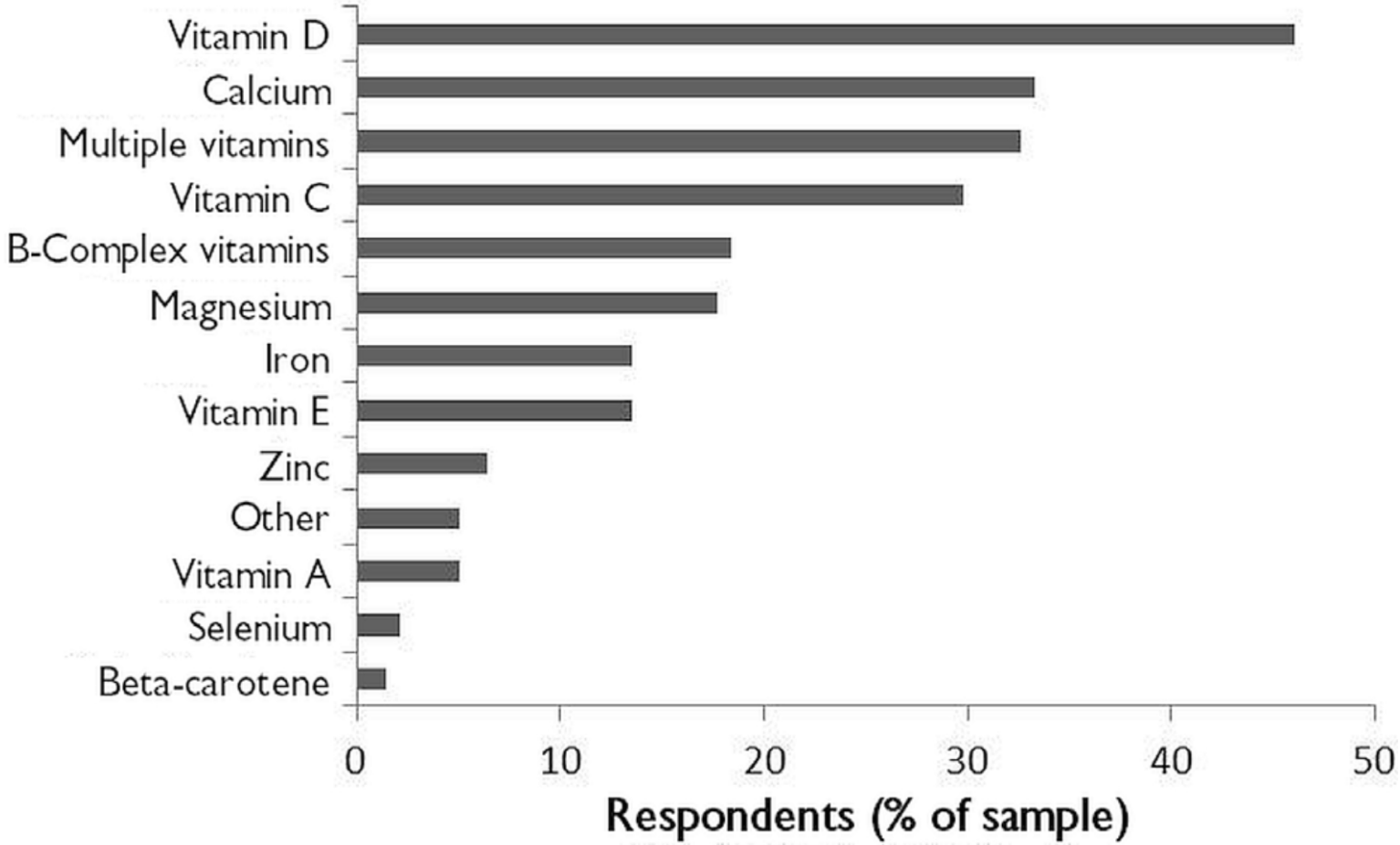
CURRENT ONCOLOGY
A Canadian Cancer Research Journal

ORIGINAL ARTICLE

Curr Oncol. 2018 Aug;25(4):e275-e281

Complementary and alternative medicine use in patients before and after a cancer diagnosis

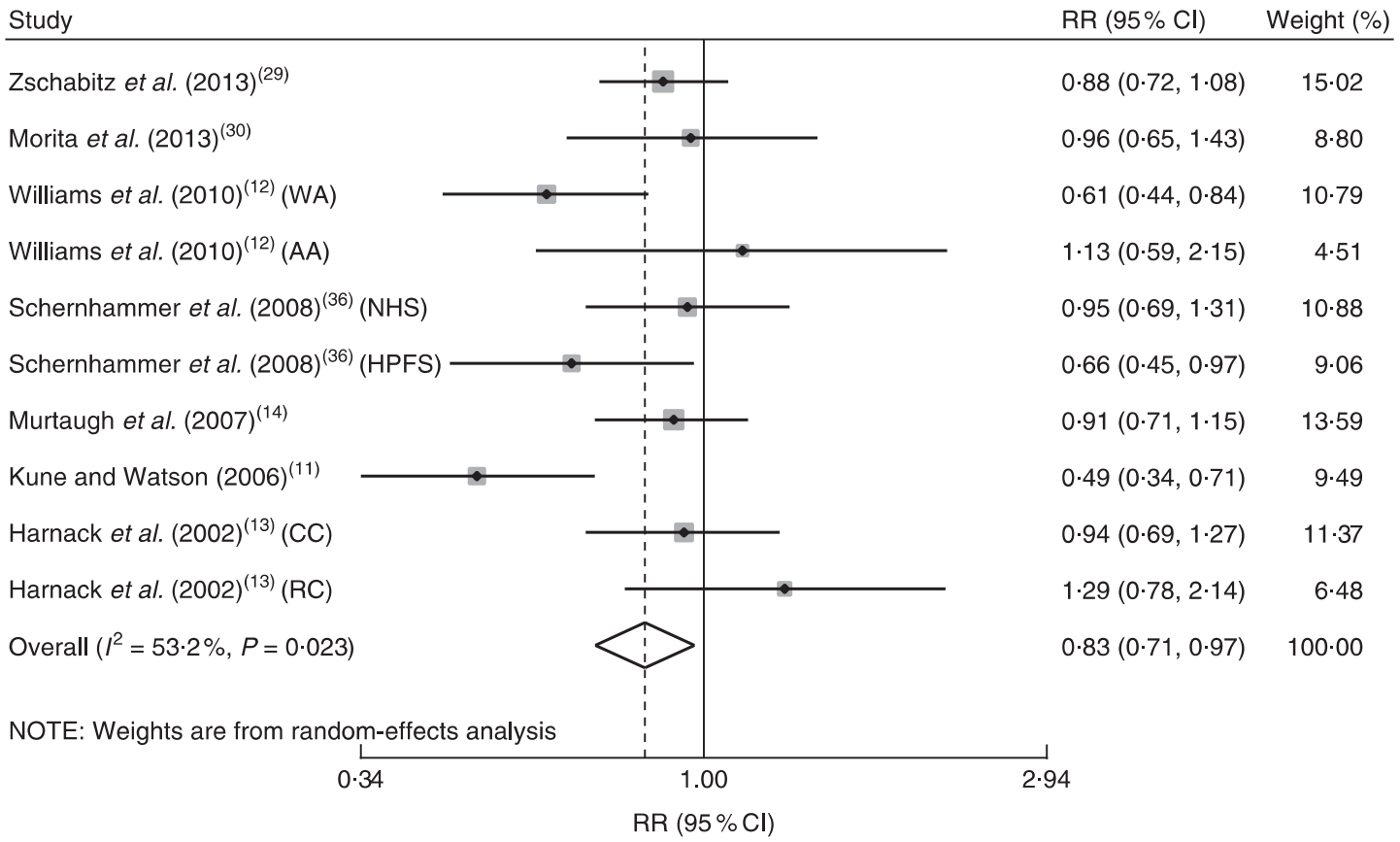
C.A. Buckner PhD,*† R.M. Lafrenie PhD,*† J.A. Dénommée BA,† J.M. Caswell PhD,* and D.A. Want MD‡



Vitamine gruppo B

Serum vitamin B12 and folate status among patients with chemotherapy treatment for advanced colorectal cancer

Public Health Nutrition: 19(8), 1446–1456 , 2015



Conclusions: Our meta-analysis indicates that evidence supports the use of vitamin B_{12} for cancer prevention, especially among populations with high-dose vitamin B_{12} intake, and that the association between CRC risk and total vitamin B_{12} intake is stronger than between CRC risk and dietary vitamin B_{12} intake only.

Vitamine gruppo B

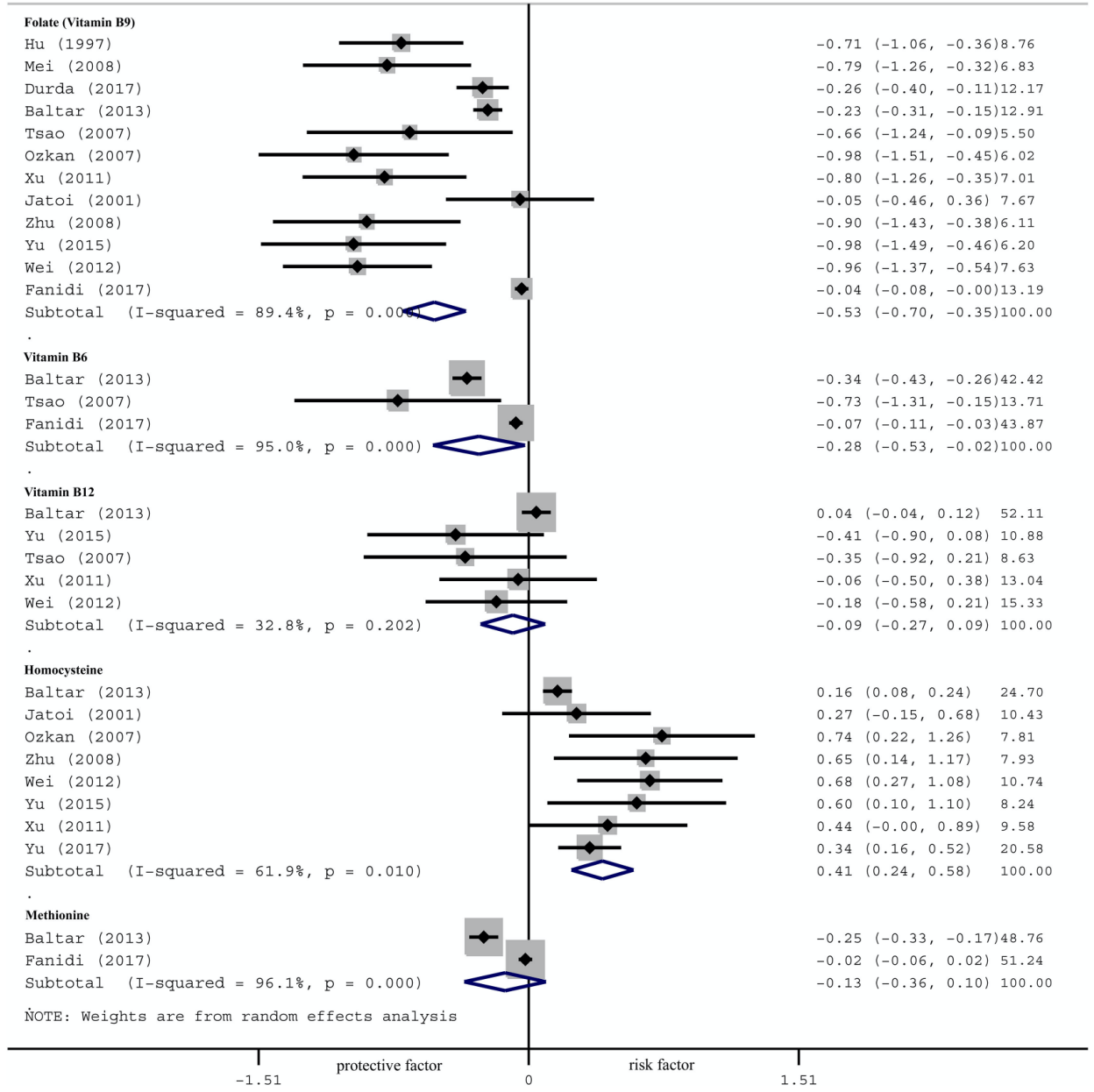


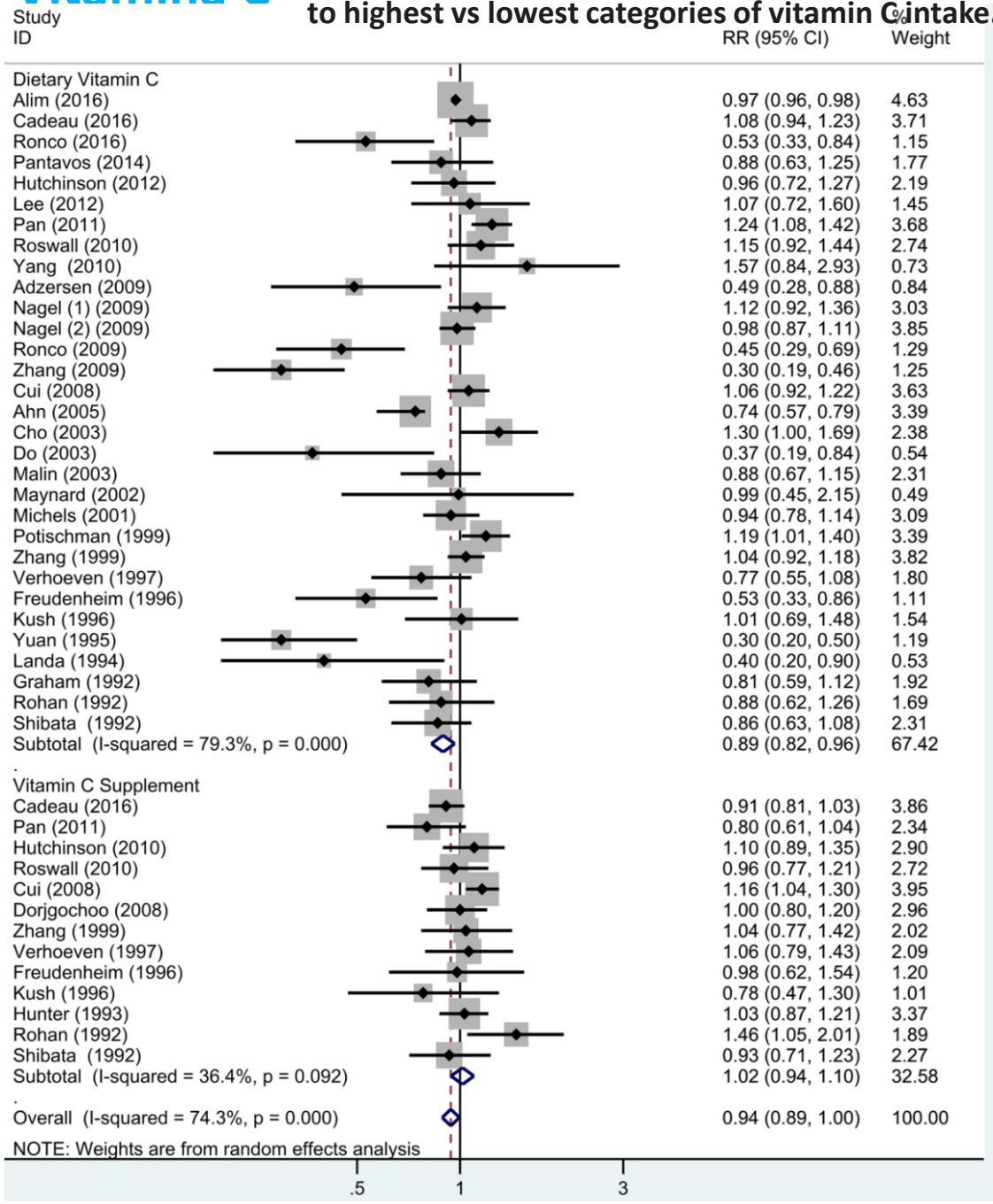
FIGURE 2 | Forest plot for OCM-related factors (folate, vitamin B6, vitamin B12, homocysteine, and methionine) and the risk of lung cancer.

frontiers in Oncology

SYSTEMATIC REVIEW
published: 31 October 2018
doi: 10.3389/fonc.2018.00493

Vitamina C

Forest plot of meta-analysis of breast cancer risk in relation to highest vs lowest categories of vitamin C intake.



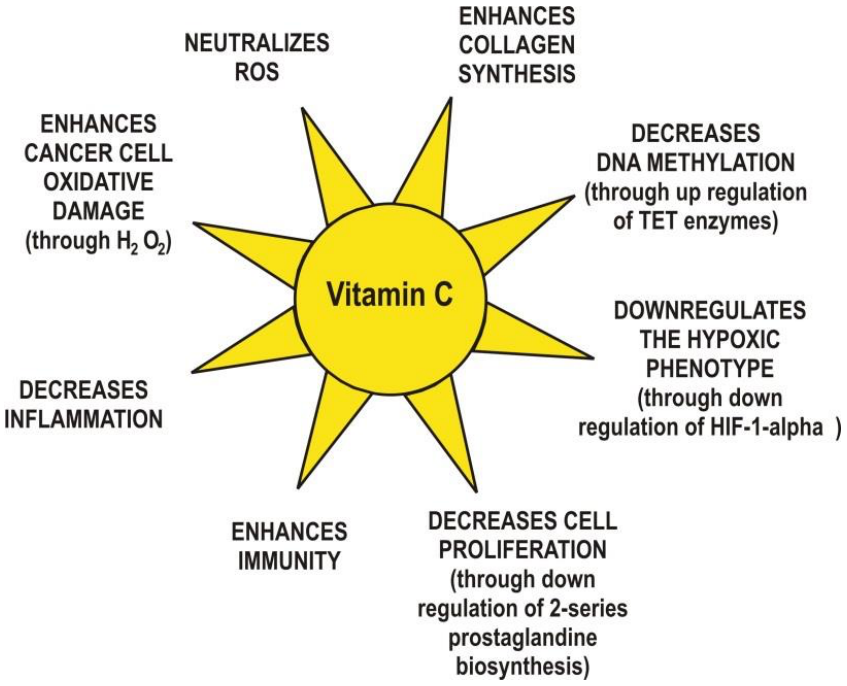
www.aging-us.com AGING 2020, Vol. 12, No. 18

Research Paper

Association of vitamin C intake with breast cancer risk and mortality: a meta-analysis of observational studies

Dai Zhang[1,2,*], Peng Xu[1,2,*], Yiche Li[3,*], Bajin Wei[1], Si Yang[1,2], Yi Zheng[1,2], Lijuan Lyu[1,2], Yujiao Deng[1,2], Zhen Zhai[2], Na Li[1,2], Nan Wang[1,2], Jun Lyu[4], Zhijun Dai[1]

International Journal of Molecular Sciences MDPI



Int. J. Mol. Sci. **2020**

OPEN ACCESS Freely available online

PLoS one

Vitamin C: Intravenous Use by Complementary and Alternative Medicine Practitioners and Adverse Effects

Sebastian J. Padayatty[1], Andrew Y. Sun[1], Qi Chen[2], Michael Graham Espey[1], Jeanne Drisko[2], Mark Levine[1]*

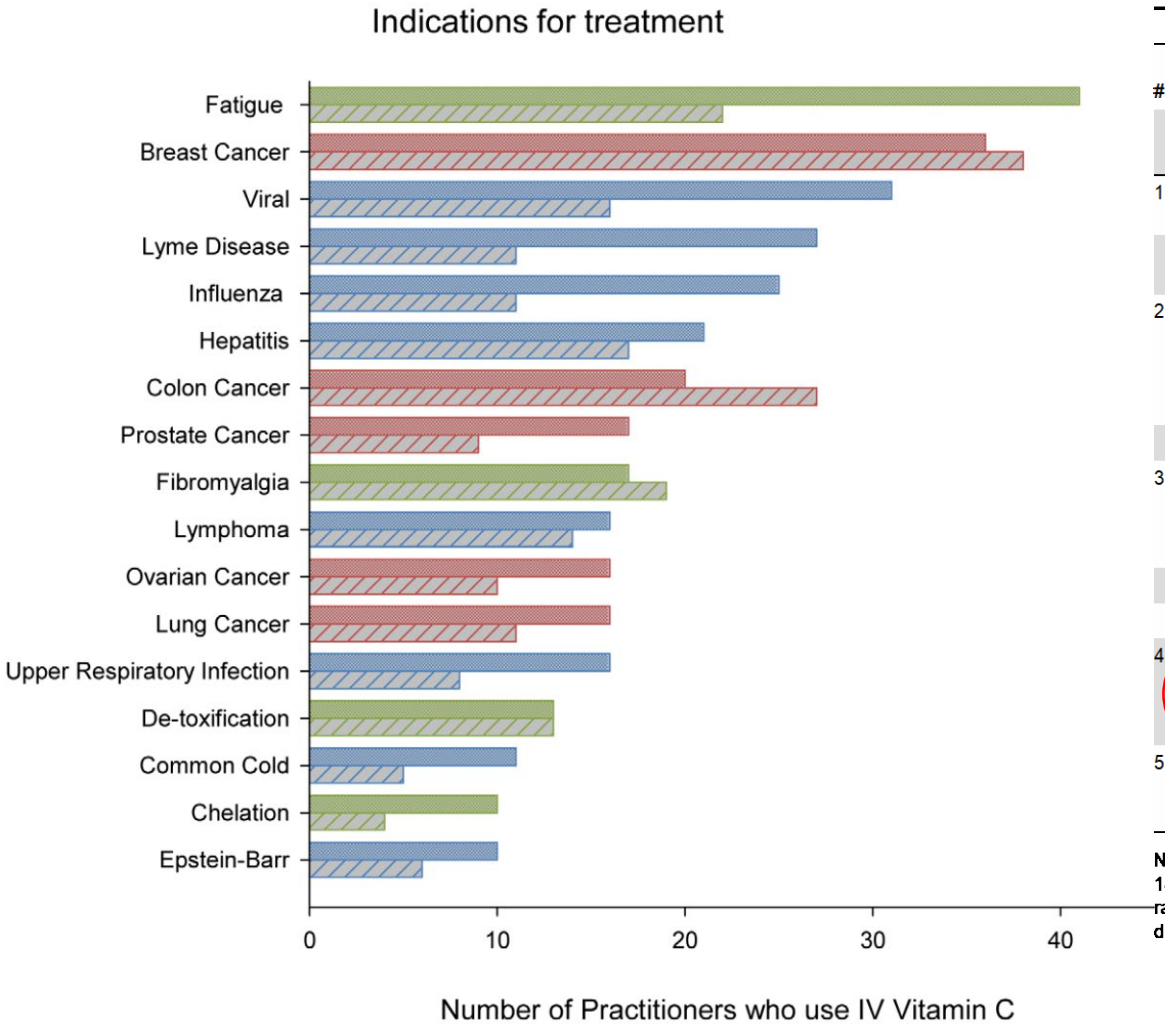


Table 5. Adverse effects of vitamin C reported in the literature.

#	Type of Side Effect	Patient Details	Vitamin C Dose	Clinical Details		Outcome (and reference)
				Pre Vitamin C Treatment	Post Vitamin C Treatment	
1	Acute Renal Failure	70 M	2.5g IV6 1 dose	Creatinine 5.0	Flank pain, hematuria. Creatinine 10.	Permanent renal failure(24)
					Renal biopsy – Calcium oxalate crystals in tubular lumen	
2		58 F	45g IV6 1 dose	Nephrotic syndrome	Oliguria. Treated with dopamine and hemodialysis. After first dialysis plasma vitamin C 15.4mg/dl (0.87mM), oxalate 2.3mg/dl. Intractable ventricular fibrillation. Post mortem- intra tubular calcium oxalate crystals.	Died(22)
				Creatinine 0.8		
3		61 M	60g IV6 1 dose	Metastatic prostate cancer	Anuric. Creatinine 13.4. Plasma vitamin C 116.2mg/dl (6.6mM). Treated with nephrostomy and forced diuresis. Renal biopsy - acute tubular necrosis and extensive oxalate deposition	Recovered(23)
				Obstructive uropathy		
				Creatinine 0.7		
4	Hemolysis in Patients with Glucose-6-Phosphate Dehydrogenase Deficiency	68 M	80g IV6 2 days	Second degree burns of one hand	Hemoglobin 5.8. Retics 5.9%. Anuria, creatinine 13.8. Coma, hemiparesis, possible intravascular coagulation. Supportive treatment and hemodialysis.	Died on day 22(25)
5		32 M	40g IV 36 /wk 20–40g/ day oral6 1 month then 80g IV6 1 dose	HIV	Breathlessness, fever, dark urine. Hemoglobin 6.7 Retics 15.6%. Bilirubin 3.16. Conservative treatment with high fluid intake	Recovered(26)

Normal ranges and units of measurement for laboratory values are: Serum creatinine - mg/dl (normal range 0.6–1.5mg/dl). Hemoglobin g/dl (normal range: male 13–18g/dl, female 12–16g/dl). Reticulocyte count in % (normal range 0.5–2.5% red cells). Plasma bilirubin - mg/dl (normal range , 1mg/dl). Plasma vitamin C - mg/dl (normal range 0.6–2 mg/dl).

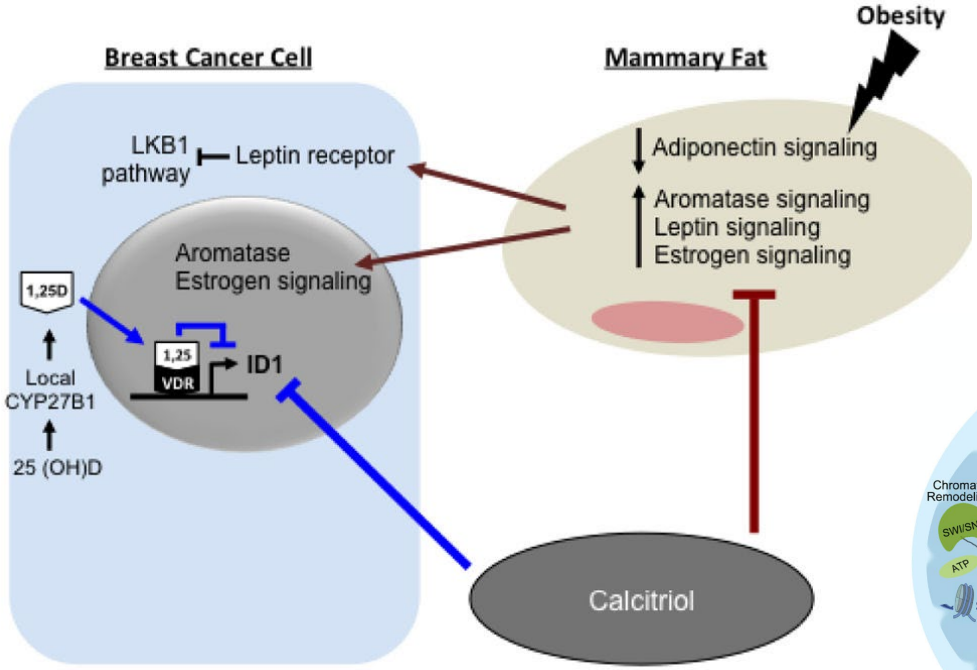
doi:10.1371/journal.pone.0011414.t005

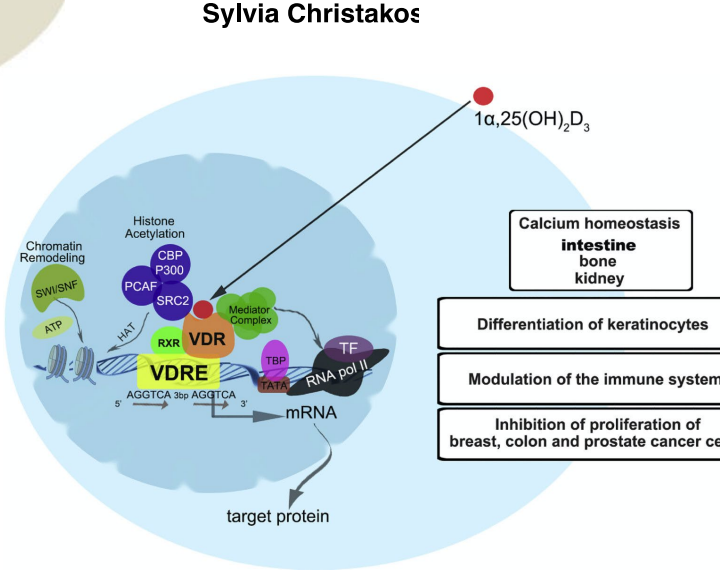
Highlights

- Epidemiological data suggests an inverse correlation between vitamin D deficiency and breast cancer risk
- Tumor-autonomous effects of vitamin D signaling suppress breast cancer metastases
- Tumor-autonomous dysregulation of *Id1* expression with vitamin D deficiency is sufficient to promote metastatic spread

Consensus Statements:

1. The relationship between vitamin D status and cancer is based on plausible mechanistic *in vitro* data, animal data and association studies in humans [128], especially for colon cancer where moderate effects of supplementation have been observed [123].
2. Published RCTs indicate that vitamin D supplementation did not significantly reduce cancer risk but did significantly improve cancer survival. However, weaknesses in the trial designs provide a cautionary note.
3. Appropriate selection of subjects (perhaps starting with a high-risk population) and other variables should be considered as components of optimal design.
4. Studies to determine the effect of vitamin D on cancer risk should be conducted for longer than 3-5 years, given the time course of oncogenesis.





International Journal of Nanomedicine

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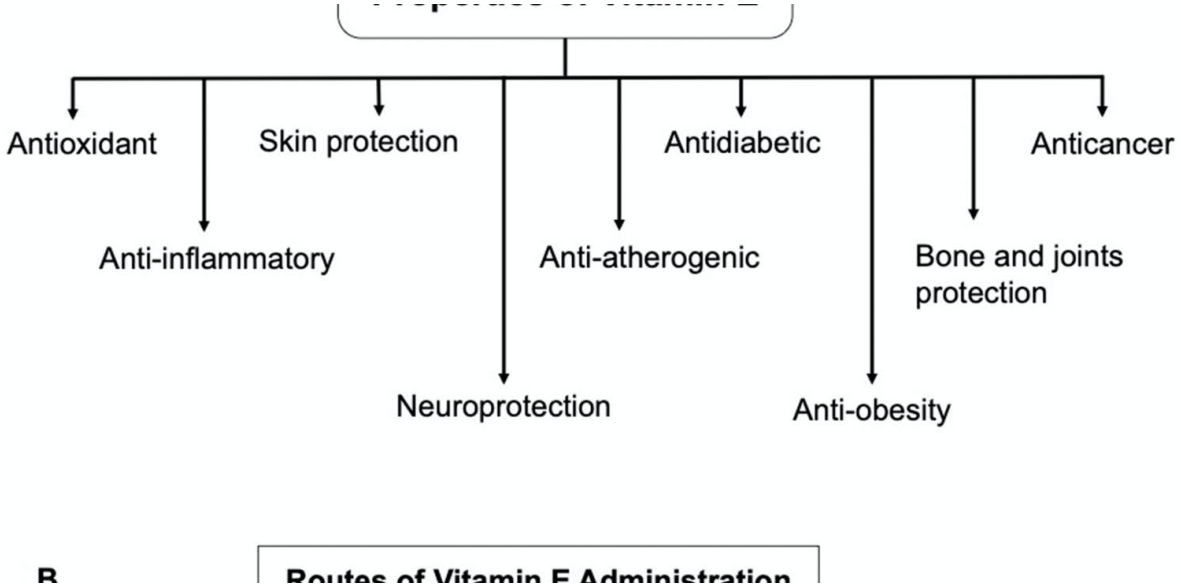
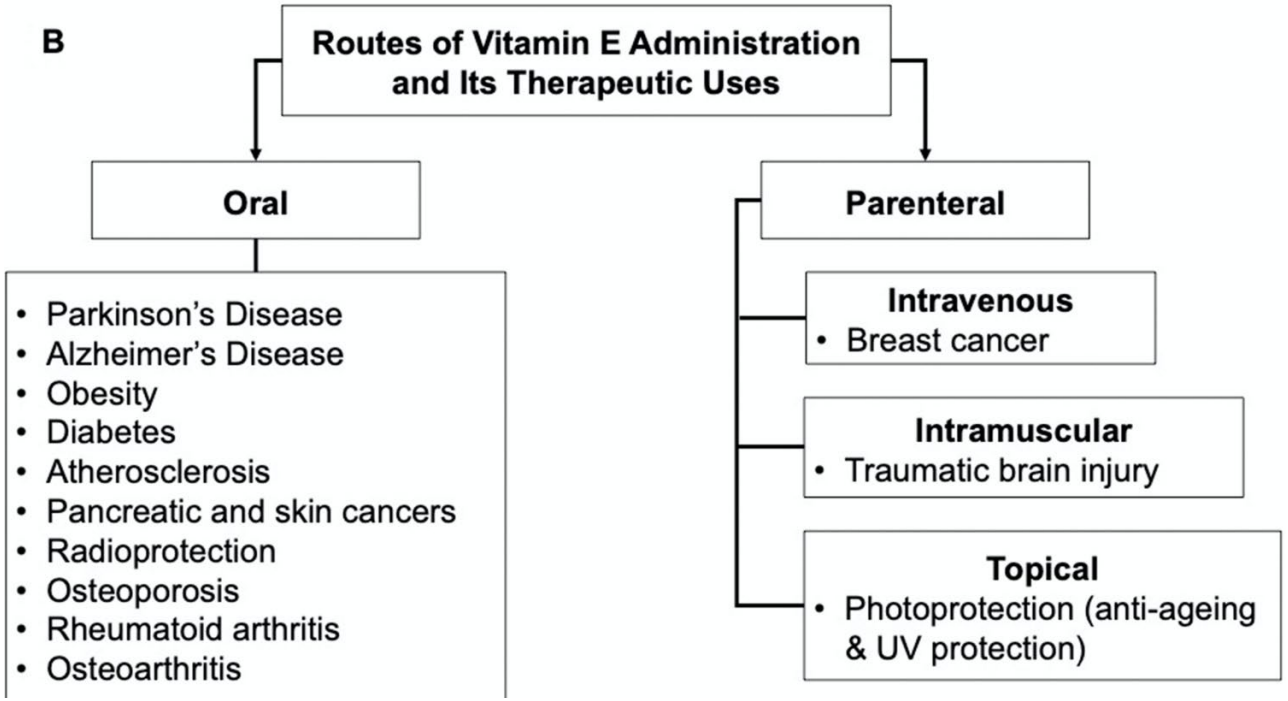
REVIEW

Pharmacology and Pharmacokinetics of Vitamin E: Nanoformulations to Enhance Bioavailability

Anis Syauqina Mohd Zaffarin [1]
Shiow-Fern Ng [2]
Min Hwei Ng [3]
Haniza Hassan [4]
Ekram Alias [1]





Nutritional Supplements and Cancer: Potential Benefits and Proven Harms

Michelle Harvie, PhD, SRD

2014

KEY POINTS

- Nutritional supplements are widely used among patients with cancer who perceive them to be anticancer and antitoxicity agents.
- Beta-carotene and vitamin E supplementation increase risk of lung, stomach, prostate cancer, and colorectal adenoma and overall mortality in the general population.
- Vitamin E and beta-carotene may reduce toxicity from radiotherapy, but there is an associated increase in recurrence especially among smokers.
- Antioxidants have variable effects on chemotherapy toxicity, but there are no data on outcome.
- Vitamin D and n-3 fats are currently being tested as potential adjuncts to maximize response to cancer therapies.

Vitamin and multiple-vitamin supplement intake and incidence of colorectal cancer: a meta-analysis of cohort studies

•Yan Liu, *Medical Oncology* **volume 32**, 2015

Vitamin B9 (folate), D, B6, and B2 intake was inversely associated with risk of colorectal cancer, but further study is needed.

Conclusioni

In pazienti sottoposti a chirurgia bariatrica/metabolica che sviluppano neoplasia, le indicazioni dietetiche e la supplementazione di microelenti devono essere individualizzate sulla base delle abitudini dieetiche basali, delle caratteristiche istologiche e genetiche della neoplasia.

Istituto Americano per la Ricerca sul Cancro (AICR) considera sicura la supplementazione di minerali e vitamine quando la posologia giornaliera rimane nel range dosaggio raccomandato giornaliero (RDA)(e.g., vitamin C: 2000 mg/die; vitamin E: 250 mg/die).

La supplementazione multivitaminica in caso di neoplasia e/o terapia oncologica deve essere monitorata con frequenza trimestrale attraverso esami ematochimici specifici .

Gli integratori utilizzati dovrebbero essere autorizzati dal Istituto Superiore di Sanità.