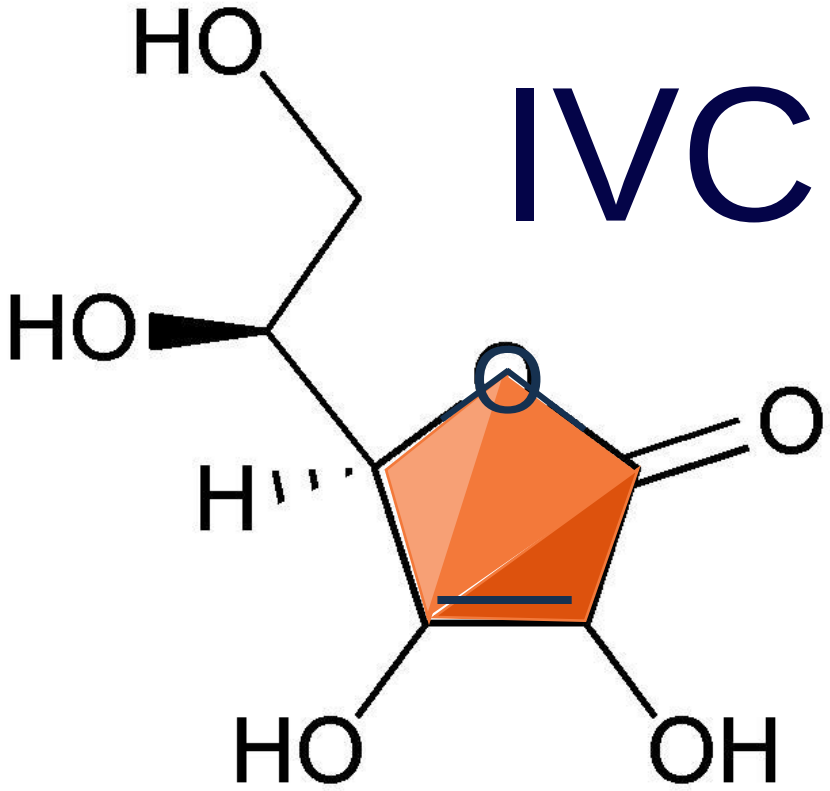
Riordan Clinic IVC Academy



IVC Efficacy & Administration

Dr. Levy is a board-certified cardiologist and a bar-certified attorney.

After practicing adult cardiology for 15 years, he began to research the enormous toxicity associated with much dental work, as well as the pronounced ability of properly-administered vitamin C to neutralize this toxicity.

He has now written eleven books, with several addressing the wide-ranging properties of vitamin C in neutralizing all toxins and resolving most infections, as well as its vital role in the effective treatment of heart disease and cancer.

Others address the important roles of dental toxicity and nutrition in disease and health.

Thomas Levy, MD, JD

Recently inducted into the Orthomolecular Medicine Hall of Fame, Dr. Levy continues to research the impact of the orthomolecular application of vitamin C and antioxidants in general on chronic degenerative diseases.

His ongoing research involves documenting that all diseases are different forms and degrees of focal scurvy, arising from increased oxidative stress, especially intracellularly, and that they all benefit from protocols that optimize the antioxidant levels in the body.

He regularly gives lectures on this information at medical conferences around the world.

His eleventh book, *Hidden Epidemic: Silent Oral Infections Cause Most Heart Attacks and Breast Cancers*, was published in September of 2017.

Thomas Levy, MD, JD

Reference Checking

Go to:
http://www.ncbi.nlm.nih.gov/pubmed/

In the PubMed search box
Enter the 7-digit number (or 8) – PubMed Identifier (PMID #)
The PMID #'s are the references in this presentation
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This will take you to the Abstract of that article
If there is no PMID number, it is not available on PubMed.

The Cause of All Disease

The onset and evolution of **all** diseases and their associated symptomatology, is caused by, and/or mediated by:

Increased Oxidative Stress (IOS)

IOS exists when the production of free radicals (highly reactive pro-oxidants) exceeds the body's antioxidant capacity to neutralize (reduce) them, or to prevent their production in the first place.

IOS **always** exists where there is a deficiency of antioxidants, an excess of free radicals, or both. **[Halliwell (2006), 16760481]**

Redox Medicine Basics

The essence of redox (reduction-oxidation) medicine is really the essence of vitamin C-based biochemistry.

Pro-oxidant (aka "toxin")

Takes, or causes to be taken, electrons away from biomolecules (OXIDATION)

Antioxidant (vitamin C is the prototype)

Gives (or restores) electrons back to oxidized biomolecules (REDUCTION)

Redox Medicine Basics

All disease results from

the relative ***presence of*** and the ***interactions between***:

Pro-Oxidants – *Toxins*

Pathogens **– Pro-Oxidant** *Providers*

Antioxidants – *Nutrients*

Signaling Oxidants

Redox Medicine Basics

The redox nature of vitamin C

and the pro-oxidant nature of all toxins

concisely explains why vitamin C, along with many other antioxidants,

has been documented to be

an effective ***antitoxin*** against ***all*** toxins

for which it has been tested *in vitro* and *in vivo*

in plants, animals, and humans, and including clinical studies.

[Levy (2002), book, *Curing the Incurable*]

Redox Medicine Basics

The difference between a signaling pro-oxidant and a toxin is usually determined by the context in which the pro-oxidant arises.

An antioxidant is a true antitoxin, because it restores the electron depletion in an oxidized biomolecule induced by the toxin,

or it reduces the electron-depleted toxin itself, making it relatively or completely inert, depending upon the toxin and its microenvironment.

All ***pathogens*** induce increased oxidative stress by oxidizing important biomolecules needed for normal metabolism.

Pathogens produce endotoxins, exotoxins, oxidized metabolic byproducts, and due to crowded space occupation from infectious bulk.

Increased Oxidative Stress (IOS): Disease Determination Factors

What disease one has depends on:

1. The ***duration*** of the IOS (acute or chronic toxicity)
2. The ***location*** of the IOS (extracellular, intracellular, specific organs or tissues)
3. The ***degree*** of the IOS (minimal to severe)
4. The ***combination*** of the above three IOS factors
   severe intracellular IOS in an organ—malignancy;
   mild intra-and/or extracellular IOS in muscle and joints—myalgias and arthralgias
5. The ***nature of the toxin (pro-oxidant)*** involved in the IOS
   such as unique chemical characteristics

Toxin Characteristics

1. Solubility properties - fat, water, combination
2. Molecular size – physical access
3. Ionic charge, neutrality
4. Unique molecular structure – physical fit
5. How readily it oxidizes certain biomolecules
6. Tendency to produce oxidative chain reactions or to oxidize single biomolecules

Toxin Characteristics

7. Tendency to target specific enzymes, amino acids, antioxidants, and antioxidant enzymes
8. Tendency to physically accumulate and block critical biomolecules from interacting
9. Toxin similarity to structural biomolecules
    - replacement, incorporation
10. Access to excretion by chelation
11. Access to excretion without chelation
12. Access to excretion by sweating

Promoters of Chronic Diseases (Pro-oxidant Sources)

1. Infections (endotoxins, exotoxins, aerobic and anaerobic metabolic byproducts, dental); documented to strongly promote oxidative stress and lessen antioxidant capacity
2. Known exogenous toxin exposures (heavy metal, pesticides, etc.)
3. Toxic iron status (most people in "normal" range are toxic)
4. Toxic calcium status (the rule in all American adults)
5. Dietary toxin exposures (constipated gut, *Clostridium*); inadequate/poor nutrition and/or poor digestion; poor digestion is worse than poor nutrition in terms of impact on the antioxidant capacity of the body
6. Low sex hormone levels; low thyroid function, especially intracellularly

8 Levels of Intracellular Oxidative Stress

At least eight levels of oxidative stress can exist over the spectrum of normal, chronically diseased, and cancerous cells:

1. **None or non-detectable** (dormant, fully differentiated, non-replicating)
2. **Minimal** (physiological, baseline metabolic activity)
3. **Minimal to moderate *physiological***

   can result in multiple signaling functions
   with upregulation or downregulation of
   various metabolic reactions taking place

   [Santos (2011), 21236334]

8 Levels of Intracellular Oxidative Stress

4. **Moderate** (chronically upregulated).

This level of increased oxidative stress can exist in a normal cell, but only transiently, as when a temporary burst of increased metabolic activity is needed, such as in active replication.

When present ***most or all of the time***, this level of intracellular oxidative stress is characteristic of non-malignant chronically diseased cells.

However, when intracellular Fenton reaction biomolecules are upregulated, this level heralds the ***arrival or imminent arrival*** of malignant transformation.

Cancer cells always have consistently increased intracellular oxidative stress, ***above*** the degree seen in non-malignant chronically diseased cells.

8 Levels of Intracellular Oxidative Stress

5. **Moderate to elevated**

When chronic, this is characteristic of established and replicating cancer cells. Some diseased cells in chronic degenerative diseases can intermittently reach these levels and not result in malignant transformation

[Zhou (2012), 23165949; Parri (2013), 23146119]

6. **Elevated** amount of intracellular oxidative stress.

Seen in the most metabolically active of cancer cells, such as actively metastasizing cells; temporarily present in normal cells only when proceeding to programmed cell death (apoptosis)

[Shen (2013), 23373752]

8 Levels of Intracellular Oxidative Stress

7. **Greatly elevated** intracellular oxidative stress,

   such as in cancer cells with significantly upregulated Fenton activity, primed by pro-oxidative agents, as in chemotherapy, to proceed to apoptosis or necrosis

8. **Maximal** intracellular oxidative stress in cancer cells,

   characteristically a fleeting state, as cells bypass apoptosis, proceeding to cell necrosis and rupture

1. What Has Vitamin C Already Been Proven to Do?

Kill/inactivate all viruses *in vitro* against which it has been tested.

Prominent examples:

A. Poliovirus:

vitamin C completely inactivated the poliovirus, ***rendering it completely non-infectious***, even when injected directly into the brains of monkeys.

Jungeblut, 1935 [19870431]

B. Herpesviruses:

Holden and Resnick (1936) The *in vitro* action of synthetic crystalline vitamin C (ascorbic acid) on herpes virus. *Journal of Immunology* 31:455-462

Holden and Molloy (1937) Further experiments on the inactivation of herpes virus by vitamin C (*l*-ascorbic acid). *Journal of Immunology* 33:251-257

2. What Has Vitamin C Already Been Proven to Do?

Kill/inactivate all viruses *in vitro* against which it has been tested.

Prominent examples:

C. Vaccinia viruses:

Kligler and Bernkopf (1937) Inactivation of vaccinia virus by ascorbic acid and glutathione. *Nature* 139:965-966

Turner G (1964) Inactivation of vaccinia virus by ascorbic acid.

J Gen Microbiol 35:75-80 [14171261]

D. Tobacco mosaic virus:

Lojkin M (1936) A study of ascorbic acid as an inactivating agent of tobacco mosaic virus. *Contr Boyce Thompson Inst Pl Res* 8:455

3. What Has Vitamin C Already Been Proven to Do?

Kill/inactivate all viruses *in vitro* against which it has been tested.

Prominent examples:

E. Bacteriophage viruses:

Murata (1975) Mechanism of inactivation of bacteriophage deltaA containing single-stranded DNA by ascorbic acid. [1214179]

Morgan (1976) The mechanism of DNA strand breakage by vitamin C and superoxide and the protective roles of catalase and superoxide dismutase. [181730]

Richter (1982) Rapid inactivation of bacteriophage T7 by ascorbic acid is repairable. [7044421]

Samuni (1983) On the cytotoxicity of vitamin C and metal ions. A site-specific Fenton mechanism. [6317379]

4. What Has Vitamin C Already Been Proven to Do?

Kill/inactivate all viruses *in vitro* against which it has been tested.

Prominent examples:

F. Enteroviruses:

Salo (1978) Inactivation of enteroviruses by ascorbic acid and sodium bisulfite. [29558]

G. Influenza virus:

Cheng (2012) [An *in vitro* study on the pharmacological ascorbate treatment of influenza virus]. [Article in Chinese] [22931805]

H. Rabies virus:

Amato G (1937) Azione dell'acido ascorbico sul virus fisso della rabia e sulla tossina tetanica. *Giornale di Batteriologia, Virologia et Immunologia* (Torino) 19:843-847; rabies virus inactivated *in vitro*

5. What Has Vitamin C Already Been Proven to Do?

Resolve all ***acute*** viral syndromes for which it has been adequately dosed.

Prominent examples:

A. Polio: Vitamin C cured acute polio (60 of 60 cases) (Klenner in 1949); full article:
http://www.seanet.com/~alexs/ascorbate/194x/klenner-fr-southern_med_surg-1949-v111-n7-p209.htm

Also, vitamin C cured acute but **advanced** polio and its associated ***flaccid paralysis***:
(Klenner in 1951); full article:
http://www.seanet.com/~alexs/ascorbate/195x/klenner-fr-southern_med_surg-1951-v103-n4-p101.htm)

6. What Has Vitamin C Already Been Proven to Do?

Resolve all ***acute*** viral syndromes for which it has been adequately dosed.

Prominent examples:

Years after Klenner's experience with polio, it was demonstrated that polio responded very well to high-dose vitamin C given ***orally*** as well, with 5 patients receiving between 50,000 and 80,000 mg given at various times over a 10-day treatment period.

Greer, 1955 [13279345]

Another clinician showed much lower doses of vitamin C clearly accelerated the resolution time of polio patients, including normalizing elevated temperatures.

Baur, 1952 [13021801]

7. What Has Vitamin C Already Been Proven to Do?

Resolve all ***acute*** viral syndromes for which it has been adequately dosed.

Prominent examples:

Acute hepatitis:

Dalton, 1962 [13883259] (Six daily 2,000 mg injections)

Cathcart, 1981 [7321921] (Reported that he never had a single case of acute viral hepatitis fail to respond to properly dosed IVC, and that he never had a VC-treated hepatitis patient subsequently develop chronic hepatitis)

Orens, 1983 [6573223] (IV and oral)

8. What Has Vitamin C Already Been Proven to Do?

Resolve all ***acute*** viral syndromes for which it has been adequately dosed.

Dr. Klenner's approach to acute hepatitis:

Initial Rx was 500 to 700 mg of VC/kg body weight by vein, given every 8 to 12 hours. As well, a minimum of 10,000 mg VC orally every day. Routinely, resolution was seen in 2 to 4 days.

Klenner also resolved acute hepatitis with 5,000 mg of VC every four hours or so orally. Complete resolution was achieved in 4 days, utilizing a total of about 120,000 mg given.

(1974) Klenner F. Significance of high daily intake of ascorbic acid in preventive medicine. *Journal of the International Academy of Preventive Medicine* 1:45-69

9. What Has Vitamin C Already Been Proven to Do?

Resolve all ***acute*** viral syndromes for which it has been adequately dosed.

Vitamin C repeatedly cured cases of viral encephalitis, many ***presenting in coma***:

(July 1949) Klenner F. The treatment of poliomyelitis and other virus diseases with vitamin C. *Southern Medicine & Surgery* 111:209-214 [18147027]

(April 1951) Klenner F. Massive doses of vitamin C and the virus diseases. *Southern Medicine & Surgery* 103:101-107 [14855098]

(1953) Klenner F. The use of vitamin C as an antibiotic. *Journal of Applied Nutrition* 6:274-278

(1971) Klenner F. Observations of the dose and administration of ascorbic acid when employed beyond the range of a vitamin in human pathology. *Journal of Applied Nutrition* 23:61-88

10. What Has Vitamin C Already Been Proven to Do?

Resolve all ***acute*** viral syndromes for which it has been adequately dosed.

Comatose New Zealand farmer with H1N1 “swine flu” directly prior to having life support discontinued (2010). See:

http://peakenergy.com/video.php

11. What Has Vitamin C Already Been Proven to Do?

Resolve all ***acute*** viral syndromes for which it has been adequately dosed.

A. Measles (simple and complicated)

B. Mumps (simple and complicated); Klenner, 1949 [18147027]

C. Herpes infections, ***acute*** (chickenpox) Dainow, 1943 68 197; Zureick, 1950 [14908970]; (1974) Klenner 1 45

D. Rabies: vitamin C-treated guinea pigs had improved survival Banic, 1975 [1191395];

No studies of humans infected with rabies and treated with VC found

12. What Has Vitamin C Already Been Proven to Do?

Documented efficacy in ***non-viral*** infections.

Diphtheria, tetanus, staphylococcus, streptococcus, pseudomonas (all documented as ***curable*** with vitamin C therapy)

While vitamin C is an absolute virucide, it is:

1. ***Often*** bactericidal
2. ***Almost always*** bacteriostatic, and
3. ***Always*** strongly supportive of an optimally competent immune system. Clinically, properly-dosed vitamin C will resolve all acute and many chronic viral infections, as well as most acute infections resulting from other non-viral pathogens

(Levy, 2002, *Curing the Incurable*)

13. What Has Vitamin C Already Been Proven to Do?

Documented efficacy in ***non-viral*** infections.

Malaria (very positive responses to very low doses) [(1938) Lotze H. Clinical experimental investigations in benign tertian malaria. *Tropical Diseases Bulletin* 35 733]

Leprosy, typhoid fever, brucellosis, trichinosis

Dysentery (amebic and bacillary)

Trypanosomal infections (Chagas' disease); *in vitro*, VC & GSH kill trypanosomes [(1937) Strangeways W. Observations on the trypanocidal action *in vitro* of solutions of glutathione and ascorbic acid. *Annals of Tropical Medicine and Parasitology* 31 405]

14. What Has Vitamin C Already Been Proven to Do?

Documented as the unrivaled nonspecific ***antitoxin and poison antidote***, *in vitro* and *in vivo*:

A. Toxic elements (mercury, lead, chromium, arsenic, cadmium, nickel, vanadium, aluminum, fluorine); [Levy, 2002, *Curing the Incurable*, pp. 280-312]

B. Venoms (snake, spider); Klenner (1971) Observations of the dose and administration of ascorbic acid when employed beyond the range of a vitamin in human pathology. *Journal of Applied Nutrition* 23 61; Klenner (1974) Significance of high daily intake of ascorbic acid in preventive medicine. *Journal of the International Academy of Preventive Medicine* 1 45

C. Alcohol; Zannoni, 1987 [3304067]

D. Barbiturates; (1971 & 1974, Klenner, see above), Kao, 1965 [5899011]

15. What Has Vitamin C Already Been Proven to Do?

Documented as the unrivaled nonspecific ***antitoxin and poison antidote***, *in vitro* and *in vivo*:

E. Toxic mushrooms; Laing, 1984 [6200941]; effectiveness of other antioxidants, ALA: Berkson, 1979 [366411]; NAC: Montanini, 1999 [10635453] (VC & antioxidant therapy still not a routine part of mushroom poisoning [Berkson article in NEJM])

F. Pesticides, six different types; (2002) Levy, *Curing the Incurable*, pp. 267-271; (1971) Klenner 23 61

G. Strychnine, tetanus; (1937) Jungeblut 33 203 [neutralized tetanus toxin *in vitro*], Dey, 1966 [5986216] [tetanus toxin neutralization *in vivo*], Dey, 1965 [14291219] [strychnine neutralization *in vitro*], Dey, 1967 [4383547] [strychnine neutralization *in vivo*]

16. What Has Vitamin C Already Been Proven to Do?

Definite ***benefits*** in the following:

A. Lyme, AIDS, ***chronic*** hepatitis

"Embedded pathogens;" vitamin C (or any other agent) cannot work optimally without physical access to the pathogen

B. Common cold; a very high requirement of vitamin C needed for the total quantity of virus usually present

C. Tuberculosis; slow-growing, slow-reacting; massive amount of literature documenting benefits of C for this

D. Pertussis; combination infection/toxin

17. What Has Vitamin C Already Been Proven to Do?

Neutralize radiation toxicity and/or repair damage from it

Just as in any other type of free radical/oxidation environment, radiation exposure results from electron loss from the affected tissues/biomolecules

Basic research: Ala-Ketola, 1974 [4450227] [vitamin C could prevent death in rats from otherwise fatal whole body ionizing radiation exposure]

Clinical research, Kennedy, 2001 [11316150] [vitamins C and E prevented side effects of pelvic irradiation in cancer patients]

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18. What Has Vitamin C Already Been Proven to Do?

Neutralize radiation toxicity and/or repair damage from it

In Japan, after the tsunami-induced nuclear plant breach, the Japanese College of Intravenous Therapy (JCIT) treated many individuals with vitamin C-centered therapies.

In an unpublished study, five Fukushima Nuclear Plant workers with heavy radiation exposure received IVC only twice monthly, along with the regular supplementation of oral liposome-encapsulated vitamin C, as well as alpha lipoic acid, selenium, and a multi-vitamin preparation. Over a two-month period, statistically significant drops were seen in a laboratory test for free DNA, as well as in a multifactorial Cancer Risk Score evaluation

1. What Has Vitamin C Already Been Proven to Do?

Vitamin C:
Practical Considerations

Regardless of whether there exists an appropriate antibiotic or other antimicrobial agent for administration, vitamin C should ***always*** be part of ***any*** protocol for ***any*** infection, acute or chronic, because:

1. Vitamin C significantly enhances immune function, in at least 20 different ways. (2002) Levy, *Curing the Incurable,* pp. 180-3
2. Vitamin C has its own direct anti-pathogen properties (iron, Fenton reaction)
3. Vitamin C neutralizes specific endotoxins, exotoxins, and the nonspecific pro-oxidant effects associated with any infection
4. All infections consume vitamin C, so failing to supplement with vitamin C means the patient with be dealing with infection-induced pre-scurvy and even frank scurvy as well (consider making ***serial*** plasma vitamin C levels a routine part of the testing in all hospitalized patients)

Intravenous Vitamin C As Monotherapy

Most commonly, for acute infectious disease, especially viral; highly effective in resulting in a prompt clinical cure; days, rather than weeks, months, or longer and only rarely with any of the negative sequelae that often result from persisting infection

Often for bacterial infections, although adding appropriate antibiotic therapy can work synergistically with the vitamin C

Used frequently for well-person immune and general health support

Intravenous Vitamin C as a Protocol Component

IVC can be an extremely useful component of virtually any treatment protocol, as a moderate to profound vitamin C deficiency is a prominent contributing and propagating force in making all chronic infections and chronic diseases worse.

The VC always works to help kill pathogens, resolve areas of focal scurvy, and fortify the immune systems in a multitude of ways.

Intravenous Vitamin C as a Protocol Component

Using IV vitamin C as part of a protocol incorporating ozone applications is proving to be an exceptional approach to all chronic degenerative diseases in general, and hard-to-treat chronic infections, such as Lyme, in particular.

It's utility in chronic disease is largely due to the associated areas of focal scurvy being treated along with the partial to complete resolution of the frequently associated sites of focal infection.

Ascorbazone Protocol

No protocol should ever be absolute and rigid, but should always be immediately modifiable depending upon clinical response. No two patients are alike, and no two patients respond to any intervention identically.

The Ascorbazone Protocol at the Riordan Clinic incorporates the concept of the Multi-C Protocol to achieve ascorbate saturation and Mop-Up IVC to minimize patient discomfort during the intensive treatment period, while optimizing the likelihood of long-term compliance with the complete protocol.

When detoxification and/or pathogen kill-off is brisk and not properly addressed, the patient not only will be less compliant, but significant immune system compromise can lessen the chances of an optimal long-term outcome.

Ascorbazone Protocol

Intravenous phase:

Day #1 (AM)

15 grams VC with 400 mg MgCl over 45 minutes, 2/3 of the infusion fast and 1/3 slow (a built-in Mop-Up IVC approach). This is followed with 2 grams of glutathione in 10 cc as an IV push.

Day #2 (AM) Pro-oxidant therapy, followed by IVC in PM

Draw blood (45 to 50 cc) to be ozonated and irradiated into NS; add 60 cc of 45 gamma concentration ozone, allow mixing, and proceed with ultraviolet irradiation, then reinfuse, followed by a 1 gram glutathione in 5 cc as an IV push.

Day #2 (PM)

25 grams IVC over 60 minutes with 800 mg MgCl, 2/3 fast, 1/3 slow, followed by 1 gram glutathione in 5 cc IV push

Ascorbazone Protocol

Day #3 AM—Same

Day #3 PM

50 grams of VC with 1 gram of MgCl over 120 minutes, 2/3 fast, 1/3 slow, followed by 1 gram glutathione in 5 cc IV push

Day #4—Same as Day #3

Day #5 AM—Same

Day #5 PM

75 grams of VC with 1.4 grams of MgCl over 150 minutes, 2/3 fast, 1/3 slow, followed by 1 gram glutathione in 5 cc IV push

Ascorbazone Protocol

Days #6 through 10

AM—Same

PM—100 grams of VC with 1.4 grams of MgCl over 180 minutes, 2/3 fast and 1/3 slow, followed by 1 gram glutathione in 5 cc IV push

Ascorbazone Protocol

Oral Phase:

1. Liposome-encapsulated vitamin C, 2 packets twice daily
2. Liposome-encapsulated glutathione, 1 packet twice daily

Best if #1 and #2 aspects of the protocol are initiated a week or more before the patient arrives at the clinic

3. Sodium ascorbate powder (if tolerated without diarrhea)

   Day #1—one rounded teaspoon

   Day #2—one rounded teaspoon twice a day

   Day #3—two rounded teaspoons twice a day

Maintain these doses indefinitely if well tolerated

Ascorbazone Protocol

Oral Phase:

4. Ascorbyl palmitate, 500 mg capsules, 2 capsules twice a day
5. Magnesium glycinate, 100 to 200 mg capsules, one capsule twice a day
6. Super K (LEF), 1 gelcap twice a day
7. Vitamin D3, 5,000 units, one gelcap a day (to later be adjusted up or down by blood levels)
8. Zinc picolinate capsules 50 mg, one capsule daily
9. Upon review with doctor, patient may initiate or continue with whatever other supplements are desired

Ascorbazone Protocol

Although hormone balance cannot be adequately addressed during a 10- to 14-day treatment period, it is vital that the initial steps are taken to eventually assure thyroid balance in both men and women, testosterone balance in men, and estrogen balance in women.

All three of these hormones play vital roles in whether infections get traction and take hold in the body, especially thyroid.

Thyroid balance, for example, gives a large amount of protection against focal dental infections getting effectively seeded into the coronary arteries (the cause for nearly all coronary heart disease).

And all three hormones play vital roles in dealing with calcium excess in the body and decreasing all-cause mortality.

Vitamin C, Ozone, and Chronic Diseases

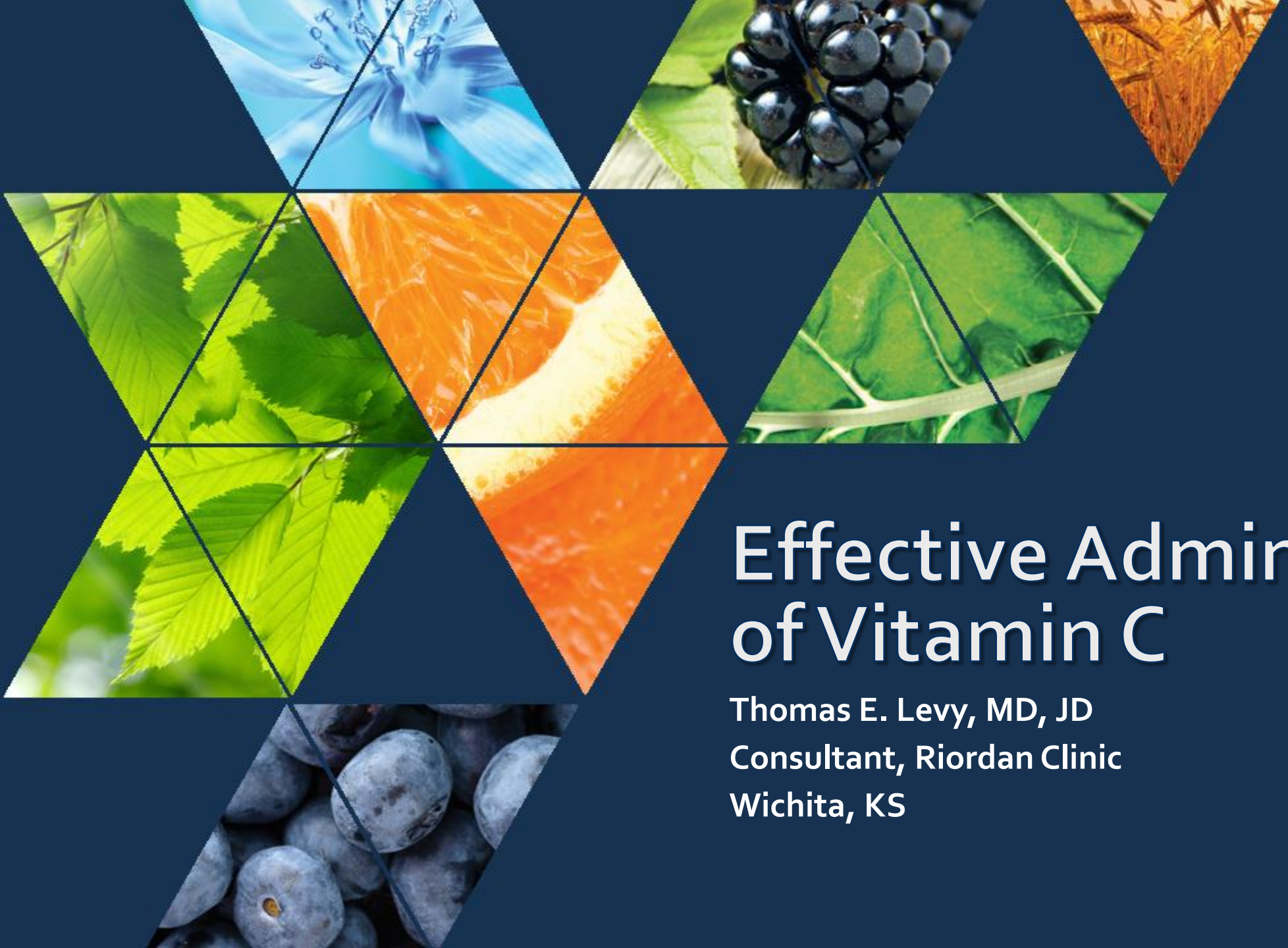
Most chronic degenerative diseases have an infectious/toxic component, and treatment will always remain inadequate and incomplete until this is addressed.

Many of the following are sources of chronic/focal infection and chronic disease, although they mostly exist in a symptomatically silent capacity:

1. Chronically infected tooth roots, gums, tooth extraction sites, implants, tonsils and lymphoid tissues, and sinuses
2. Non-oral cavity sites, including bronchi, gut, gallbladder, liver, fallopian tubes/uterus, prostate gland, skin, heart, kidney, joints, veins, and bone.

Recap

1. Increased oxidative stress is the final common denominator of all chronic degenerative disease.
2. Reducing oxidized biomolecules and/or preventing the oxidation from taking place will mitigate all diseases and reverse them as well if too much secondary structural/mechanical damage has not occurred.
3. Vitamin C is a foundational treatment that should be applied to ALL chronic diseases.
4. Intravenous vitamin C is a highly effective and wide-ranging treatment that remains little appreciated in spite of low cost and no documented toxicity.



Effective Administration of Vitamin C

Thomas E. Levy, MD, JD
Consultant, Riordan Clinic
Wichita, KS

Riordan Clinic

Treatment Principles for All Chronic Degenerative Diseases

1. **Prevent/minimize** new daily toxin exposure (environmental, dental, dietary, digestive)
2. **Neutralize** existing toxins present in body
3. **Excrete** toxin stores in a non-toxic, or minimally toxic, manner
4. **Resolve** infections, and eliminate the reasons for contracting new infections
5. **Supplement optimally** to maximize the antioxidant/nutrient status of the body as completely as possible
6. **Address hormone imbalance**, typically deficiencies of testosterone, estrogen, and/or thyroid hormone

Factors in the Effective Administration of Vitamin C

The primary aim of any vitamin C protocol:

Vitamin C, in its active, reduced form, needs to maximally accumulate inside the cells of the target tissue(s). As well, vitamin C should reach optimal concentrations in the extracellular spaces as well.

Factors in the Effective Administration of Vitamin C

1. Dose (multigram always, except with some renal disease)
2. Route (oral, regular; oral, liposome; intravenous; intramuscular)
3. Rate (consider clinical status of patient)
4. Frequency (symptom response)
5. Duration (clinical status, symptom response)
6. Type (avoid calcium ascorbate)
7. Adjunct therapies (not usually necessary to avoid; antibiotics where appropriate)
8. Safety
9. Overall protocol of administration

Factors in the Effective Administration of Vitamin C

Dose

Almost all clinical failures of vitamin C administration are due to inadequate C delivery to the target tissues, usually a result of inadequate dosing.

While lower doses will still be of benefit to the patient, a 30-gram IV infusion may result in little discernible clinical improvement, while a 50-gram, a 100-gram, or a 150-gram infusion could still demonstrate progressively more positive clinical responses.

Tiny (<500 mg) doses of vitamin C can sometimes trigger a pro-oxidant response, due to triggering of the Fenton reaction at various sites in the body.

These microdoses of vitamin C account for virtually all of the "negative" articles regularly published about the *in vitro* and *in vivo* effects of vitamin C.

Factors in the Effective Administration of Vitamin C

Route & Form

When "regular" vitamin C is used, the intravenous route is always the most desirable (sodium ascorbate, buffered ascorbic acid); however, intramuscular is very effective as well, and was used frequently by Dr. Klenner

Factors in the Effective Administration of Vitamin C

Route & Form—Intramuscular

In Dr. Klenner's own words:

"In small patients, where veins are at a premium, ascorbic acid can easily be given intramuscularly in amounts up to two grams at one site. Several areas can be used with each dose given. Ice held to the gluteal muscles until red, almost eliminates the pain. We always reapply the ice for a few minutes after the injection. Ascorbic acid is also given, by mouth, as followup treatment. Every emergency room should be stocked with vitamin C ampoules of sufficient strength so that time will never be counted—as a factor in saving a life. The 4 gram, 20 cc ampoule and 10 gram 50 cc ampoule must be made available to the physician." [Typically sodium ascorbate or ascorbic acid buffered with sodium bicarbonate]

(1971) Klenner F. Observations on the dose and administration of ascorbic acid when employed beyond the range of a vitamin in human pathology. *Journal of Applied Nutrition* 23:61-88.

Factors in the Effective Administration of Vitamin C

Intramuscular administration of vitamin C

Used with great positive effect by Dr. Klenner; a way to keep VC levels in the tissues from bottoming out; also highly effective as VC monotherapy in infants and young children

One formula:

2 cc of VC (500 mg/cc); 1 cc of sterile water; 0.5 cc 8.4% $NaHCO_3$; 1 cc of 2% procaine

Factors in the Effective Administration of Vitamin C

Route & Form

Oral liposome-encapsulated vitamin C vs. regular C

1. Rapid and very enhanced absorption (Ling, 2006 [16556538])
2. No stomach upset & no ascorbate-induced diarrhea
3. Intracellular bioavailability (Yamada, 2008 [18655816]; (Rawat, 2007 [17944316])

Factors in the Effective Administration of Vitamin C

Route & Form

Liposomes orally:

4. Ultimate delivery in the reduced form (much of the doses of the other forms of regular vitamin C, including those given intravenously, need to be in the oxidized form [DHAA] to be taken into cells). This means that regular vitamin C given orally ***or intravenously*** needs to ***consume energy*** to end up inside the cell or its organelles in its active, electron-donating form. (Goldenberg, 1994 [7844110]; Liang, 2001 [11396616]; Meister, 1994 [8144521])

Factors in the Effective Administration of Vitamin C

Route & Form

5. Independent supplemental value of the phosphatidylcholine content of the liposome, in the following ways:

Antioxidant (Das, 2007 [17877144])

Anti-atherosclerotic agent (Altman, 1980 [7190404])

Cholesterol lowering (Mastellone, 2000 [11091102])

Treatment for liver disease (Buang, 2005 [15975496])

Anti-inflammatory agent, protection against ischemia (Demirbilek, 2006 [16834655])

Treatment and prevention of cell membrane damage (Lubin, 1972 [5009118])

Factors in the Effective Administration of Vitamin C

Rate

This factor pertains to intravenous forms of vitamin C.

Rate is determined by many factors, most importantly whether the patient is ***critically (acutely) ill***, or ***chronically ill***.

Imminently life-threatening situations may require rapid infusion (for example, 50 grams in 20 to 30 minutes)

or ***even IV push*** (several grams in a minute or two)

Factors in the Effective Administration of Vitamin C

Rate

In Klenner's words:

> In a cyanotic, acutely-poisoned patient who felt he way dying, Klenner wrote: "Twelve grams of vitamin C was quickly pulled into a 50 c.c. syringe and with a 20 gauge needle was given intravenously as fast as the plunger could be pushed. Even before the injection was completed, he [the patient] exclaimed, 'Thank God.'" (Venom of the Puss Caterpillar, resembling a mouse and later identified at Duke University)

(1971) Klenner F. Observations of the dose and administration of ascorbic acid when employed beyond the range of a vitamin in human pathology. *Journal of Applied Nutrition* 23:61-88

Factors in the Effective Administration of Vitamin C

Rate

Be aware that IV push or very rapid infusions of multi-gram amounts of vitamin C will reliably produce some degree of ***hypoglycemia***.

The pancreas "views" the large amount of vitamin C in the blood as glucose, as vitamin C and glucose are very similar molecules, and a substantial amount of insulin is then reflexly released by the pancreas.

However, the vitamin C does ***lessen the clinical impact*** of the hypoglycemia, as glucose levels of 20 to 25 can actually be tolerated for extended periods of time.

This can be effectively viewed as a "protected hypoglycemia."

Factors in the Effective Administration of Vitamin C

Rate

Multi-gram doses of vitamin C given IV push, or even infused at a rapid rate, can be considered, both theoretically and from a clinical point of view, as an ***endogenously-induced*** form of ***insulin potentiation therapy (IPT)***. For more information on IPT: (Ayre, 1986 [3526099])

Factors in the Effective Administration of Vitamin C

Rate

If patient tolerance factors prevent rapid infusion, adding between 0.5 to 2.0 units of regular Humulin insulin per 25 grams of VC can achieve a similar effect to the very rapid infusion.

If no hypoglycemic effects are induced, then more insulin should be used

Factors in the Effective Administration of Vitamin C

Rate

- Whether by rapid infusion of VC or by the addition of exogenous insulin, have 50% dextrose for IV push available, or just fruit juice or even candy for better tolerated hypoglycemia. However, advise the patient that the longer they tolerate the hypoglycemia, the more the VC (and other administered nutrients) are getting into the cells.
- Document by blood testing that significant hypoglycemia has been achieved.

Factors in the Effective Administration of Vitamin C

Rate

Coordinate the time periods of low glucose/high insulin with anticipated highest blood and extracellular fluid levels of administered nutrients and medicines that are felt to have optimal impact when taken up by the diseased/cancerous cells

Factors in the Effective Administration of Vitamin C

Rate

When the IV rate is very rapid, don't have other meds/nutrients in the IV; only the VC should be hyper-rapidly infused; follow the rapid phase of the IV with a slower phase with other important components, such as magnesium, B-vitamins, and other antioxidants

Factors in the Effective Administration of Vitamin C

Rate

When the patient feels poorly after hypoglycemia is resolved, initiate a "Mop-Up" phase to the IV protocol

Infuse roughly 25% of the vitamin C dose given rapidly, and infuse it over at least twice the time; this neutralizes and "mops-up" circulating pro-oxidant debris without initiating further detox, and the patient will usually leave the clinic feeling well.

Factors in the Effective Administration of Vitamin C

Rate

A possible consideration: Continuous, 24-hour infusion of 200 to 400 grams of vitamin C; originally suggested by Dr. Klenner specifically for cancer; maintain brisk urine output

Requires a hospital or a clinic that can accommodate around-the-clock care; best regulated with a IV infusion pump

Possible augmentation by intermittent IV pushes of several grams of VC during the continuous infusion period

Factors in the Effective Administration of Vitamin C

Frequency

The frequency of vitamin C dosing in any of its forms is a completely clinical, symptom-response factor in vitamin C therapy.

For very acute infectious diseases, Dr. Klenner would give additional large doses of vitamin C after the initial dose when vital signs and the patient's reported sense of well-being were not clearly improving. With improvement, follow-up dosing could be of lesser amounts on a less urgent schedule of administration. Nearly all docs today use higher doses less frequently (daily or less), since they are practicing out of their offices, without the benefit of hospitalization, and clinical responses are not as profound and rapid as Dr. Klenner reported.

Factors in the Effective Administration of Vitamin C

Duration

The duration of an acute vitamin C administration protocol needs to be long enough to allow complete eradication (infection) and/or neutralization (toxin) of the disease/pathology being treated.

For life-threatening or otherwise severe infectious diseases, continue vitamin C at high, frequent doses for ***at least 24 hours***, and probably for at least 48 hours ***after*** you feel the patient has already reached clinical normalcy. Otherwise, a complete clinical relapse is possible. (For similar reasons, antibiotics are often prescribed for 10 to 14 days, usually many days after the appearance of clinical normalcy.)

Factors in the Effective Administration of Vitamin C

Type

The essence of vitamin C is its **ascorbate anion**. The associated cation may be any of the following:

- Hydrogen (ascorbic acid)
- Sodium
- Calcium
- Magnesium
- Potassium
- Manganese
- Zinc
- Molybdenum
- Chromium
- Other (such as ascorbyl palmitate)

Factors in the Effective Administration of Vitamin C

Type

Hydrogen ascorbate (excellent; can upset stomach)

Sodium ascorbate (excellent; no problem with hypertension or congestive heart failure (Kurtz, 1983 [6648527]; Kurtz 1987 [3309653]); no problem with stomach upset

Calcium ascorbate ("buffered" vitamin C; not recommended due to calcium content)

Potassium ascorbate (OK in small amounts; large amounts of potassium are potentially fatal)

Other mineral ascorbates (good supplements, but needlessly expensive, with risk of too much of a specific mineral)

Factors in the Effective Administration of Vitamin C

Adjunct Therapies

Unless another therapy is inherently pro-oxidant and toxic, vitamin C will only augment the desired effects. And even with highly toxic agents, proper vitamin C administration can help produce the desired outcome by reducing otherwise unavoidable and therapy-limiting side effects.

No need to avoid antibiotics; vitamin C works very well in enhancing their antimicrobial effects (many antibiotics are little more than iron chelators, lessening the ability of pathogens to proliferate)

Chemotherapy (pro-oxidant & toxic); vitamin C will neutralize only if taken ***simultaneously*** (encountering it in the blood); otherwise, vitamin C works well in correcting the damage done by chemotherapy to normal, non-tumor tissue, although vitamin C loading will protect normal cells better if given before chemo.

Factors in the Effective Administration of Vitamin C

Physiological VC facilitators

Magnetic fields

With cancer, considering using static North-seeking pole field during IVC/nutrient infusions

PEMF (pulsed electromagnetic field)

If the cancer is not accessible by a static North pole magnet, and if it is not responding, use PEMF concentrated over cancer site *only during VC infusion, not chronically*

Factors in the Effective Administration of Vitamin C

Magnetism, VC, and Cancer

- Both static fields increase electroporation as well; muliple studies indicate PEMF can help resolve cancer, probably via increased electroporation
- Optimal to use only North-seeking pole if possible, but if access is not feasible, use PEMF, but only during IVC and nutrient infusion and ingestion, not chronically

Factors in the Effective Administration of Vitamin C

Safety

According to Dr. Klenner:

"Ascorbic acid is the safest and the most valuable substance available to the physician. Many headaches and many heartaches will be avoided with its proper use."

An assertion now completely validated after countless intravenous administrations over the last 65 years.

(Padayatty, 2010 [20628650])

Factors in the Effective Administration of Vitamin C

Intravenous Vitamin C: Dose

In general, for any given administration of IVC, give from 1 to 1.5 grams per kilogram of body weight; 50 grams might be perfect for a 110-pound woman, but not remotely enough for a 250-pound man. Most children will do well on 25 to 50 grams infused at a time.

Also, the extent of infection and/or the degree of toxin accumulation and ongoing toxin exposure/production will ***greatly*** affect what your proper dose of vitamin C should be.

Factors in the Effective Administration of Vitamin C

Intravenous Vitamin C: Rate

Anywhere from IV push to a four-hour infusion; the rate depends upon:

1. How clinically stable the patient is
2. Localized or systemic condition
3. Infectious disease
4. Toxin exposure
5. An acute illness or a chronic degenerative disease (such as cancer or coronary atherosclerosis)
6. Comfort of the infusion (must be adjusted so that **no pain** is present)

“Mop-Up” IVC

When patient feels worse after IVC or even highly-dosed oral vitamin C, a “Herxheimer-like” reaction is often the cause.

This can be due to an accelerated release of stored intracellular toxins at a rate in excess of what the ongoing VC being administered can neutralize.

It can also be secondary to a massive kill-off of pathogens, with substantial amounts of reactive iron and other pro-oxidant “debris” in the lymphatics and blood.

Similarly, it can be due to a massive kill-off of susceptible cancer cells, along with substantial amounts of reactive iron and pro-oxidant “debris” being released as well.c

“Mop-Up” IVC

When such a “Herxheimer-like” or perceived detox reaction occurs and the patient feels poorly, with a recrudescence of symptomatology of any of a number of underlying disease processes, the IVC being administered should either be stopped (or finished, if close to the end of the infusion). This should be immediately followed by a low-dose, slow-flow (“Low & Slow”) infusion of vitamin C. This low and slow infusion immediately neutralizes circulating pro-oxidant debris in the blood (and lymph), while not further stimulating an increased kill-off or detox that is associated with the higher-dosed, rapidly flowing infusion of vitamin C.

"Mop-Up" IVC

A good rule of thumb is to follow the therapeutic VC infusion with a Mop-Up IVC that is ***at most*** less than one-half the therapeutic dose and ***at most*** infused at less than one-half the initial therapeutic dose rate. If clear improvement does not occur within 15 to 20 minutes, slow the rate of the Mop-Up infusion again by 50%.

For example, a patient who does not tolerate 50 grams given over one hour well will probably respond very well within 20 to 30 minutes to 10 to 20 grams infused at a rate to go in over 2 hours. When symptom relief appears complete, the IV can be discontinued and oral forms can be administered.

Although seemingly counterintuitive, the Mop-Up IVC works very well in clinical practice, making for a happier patient and improved doctor/patient relationship.

Factors in the Effective Administration of Vitamin C

Multi-C Protocol

1. Oral liposome-encapsulated vitamin C (for optimal ***intracellular*** access by ascorbate)
2. Multigram doses of sodium ascorbate powder, taken several times daily, up to or reaching bowel tolerance (in order to minimize gut toxicity & support ***extracellular*** access by ascorbate) (Cathcart, 1981 [7321921]; Cathcart, 1984 [4069036])
3. Oral administration of ascorbyl palmitate (for optimal ***fat-soluble*** access by ascorbate) (Pokorski, 2004 [15209539]; Pokorski, 2003 [12595755]; Ross, 1999 [9890643])
4. Intermittent IV administration of ascorbate (to optimize ***extracellular*** access by ascorbate, as well as to further ***support*** intracellular pools of ascorbate)

For Contact and Further Information

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Final Note

I appreciate very much the opportunity to present to this distinguished audience the concepts and information contained in this presentation.

Your comments, questions, or thoughts regarding what was presented are welcome. Please feel free to contact me at:

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Thank You.

Thomas E. Levy, MD, JD