

# C-STRIPS

## GENERAL INFORMATION

C-Strips are chemically treated test papers used for measuring the Vitamin C content of urine.

However, if left at room temperature, C-Strips will fade in several weeks. So it's **IMPORTANT** that you remove the number of strips you expect to use in the next few days, store them carefully in a cool dry place, and **PLACE THE REMAINDER IN THE FREEZER**. Here they'll keep in perfect condition for over a year. Also, **DO NOT TOUCH** the strips. It is critically important that you use the tweezers provided in the pack to pick up the C-Strips, as any Vitamin C on your fingers will begin a reaction in the paper. Likewise, it is important to clean the tweezers after each use.

The spillover of Vitamin C in the urine is a result of exceeding the renal threshold for Vitamin C. The renal threshold (approx. 1.7mg% for Vitamin C) is the level above which Vitamin C in the plasma is filtered out by the kidneys and may become part of the urine. So, in the total plasma of the blood stream of an adult (approx. 2,000mLs) the total amount of Vitamin C cannot exceed approx. 34mg before it starts to spill over. This is NOT a great amount. Furthermore, this spillover of Vitamin C does NOT mean that all *tissues* of the body that store quite high levels of Vitamin C (eg. the adrenals, white cells, nervous system, connective tissues), have their *tissue* pools of Vitamin C at their optimum level. To demonstrate this, imagine that you are trying to fill a barrel that has a hole towards its base. As you try to fill the barrel, fluid spills out through the hole. This phenomenon is not dissimilar to trying to saturate all the body tissues with their optimum levels of Vitamin C.

Of course, the dynamics of Vitamin C intake, Vitamin C absorption, Vitamin C use, Vitamin C storage and adequate kidney function finally determine how much Vitamin C will be excreted via the urine.

Many different factors can effect the use of Vitamin C in the body (eg. infection, stress, pollution, degenerative disease, shock, the pill, etc.)<sup>(1)(2)(3)</sup>, so to build up these Vitamin C stores within the body again requires supplementing with adequate levels of Vitamin C. Since urinary spillover occurs at plasma levels of > 1.7mg%, it takes quite a while to build up the levels of Vitamin C in other body tissues.

The measure of spillover at least tells the user that sufficient levels of Vitamin C have been ingested, and absorbed to reach a level in the bloodstream so that there is at least approx. 34mg in the plasma. If the Vitamin C is not being adequately absorbed, or is being used up very quickly in the body, then this level may not be achieved and there may be either NO spillover, or limited spillover.

In general, to avoid the borderline effects of hyposcorbaemia, a healthy spillover of > 10mg% in the urine is suggested.




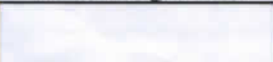
## INSTRUCTIONS FOR MEASUREMENT OF VITAMIN C IN URINE

C-Strips are not just tests for acidity, but are specific tests for Vitamin C. Acids will turn the C-Strips pink. Vitamin C turns the blue strips white. Vitamin C is by far the strongest reducing substance likely to be found in urine. From this point of view, within the time frame of measurement considered in this document, C-Strips are highly specific for Vitamin C.

The following tests are best performed before meals, preferably before breakfast, and certainly before taking any Vitamin C.

NOTE: For optimum measurement of Vitamin C content in urine, the C-Strip should be added as quickly as possible to the urine after it is collected to avoid the in-vitro breakdown of Vitamin C.

- Spot Urine Test:** Before a meal, collect a sample of urine into a clean, clear container. Place in a good light (fluorescent or daylight is better) and on a white surface, or a sheet of white paper. Immerse a blue C-Strip into the urine sample. Push it under the surface with the tweezers and let it drop to the bottom. Don't stir or agitate. Count the seconds from the instant of immersion until most of the blue disappears. Refer to the diagram below for end point colour comparison. If the time taken for the colour change is less than 30 seconds, then the concentration of Vitamin C in the urine is greater than 50mg/100mL. If the colour change is less than 3 seconds, this suggests that the concentration of Vitamin C in the urine is greater than 200mg/100mL.

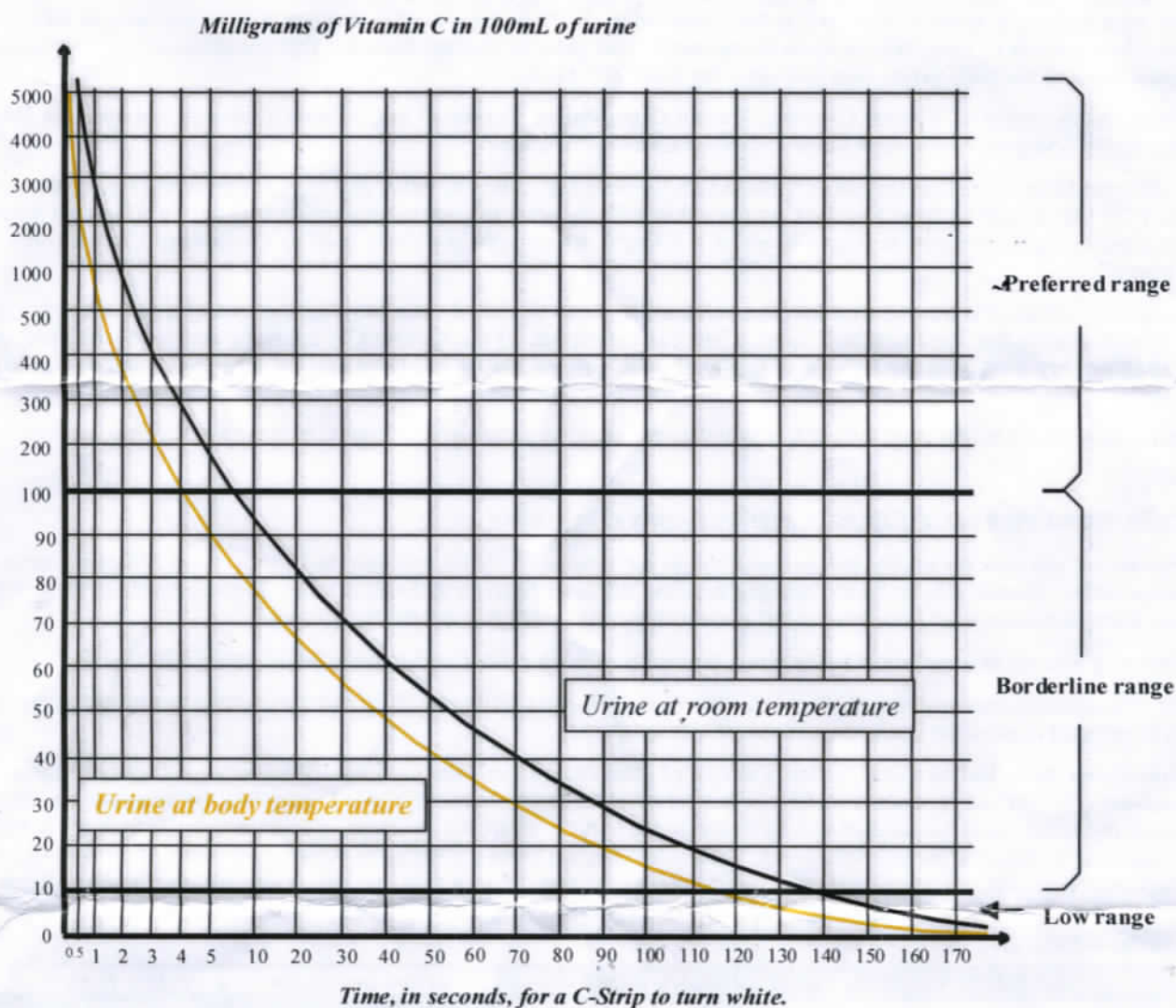
END POINT COLOUR COMPARISON CHART	Before Immersion	After Immersion
Expected Colour change for urine that is <b>LOW</b> in Vitamin C:		
	Dark Blue	Mottled Light Blue
Expected colour change for urine that is <b>HIGH</b> in Vitamin C:		
	Dark Blue	White

**INSTRUCTIONS FOR MEASUREMENT OF VITAMIN C IN URINE (Continued)**

**2. Semi Quantitative Test:** Collect urine as described above. Place in a good light (fluorescent or daylight is better) and on a white surface, or a sheet of white paper. Immerse a blue C-Strip into the urine sample. Push it under the surface with the tweezers and let it drop to the bottom. Don't stir or agitate. Count the seconds from the instant of immersion until most of the blue disappears. Refer to the diagram over for end point colour comparison. If the C-Strip has not turned white within 60 seconds, give it a stir with the tweezers for 5 seconds and thereafter every 60 seconds for 5 seconds until the end point is reached. The exact moment to stop counting can't be found exactly without costly optical equipment. But your best guess should allow you to determine the Vitamin C concentration to within a factor of 2 over a total possible range of 5,000mg to 1mg. After counting, refer to the chart below to find the approximate level of Vitamin C in your urine. For instance, if you counted 60 seconds with your sample at BODY TEMPERATURE, refer to the YELLOW curve to find that the urine's Vitamin C level is 35 milligrams per 100mL of urine.

With high concentrations of Vitamin C, it becomes necessary to count fractions of a second. To avoid this problem, merely dilute 1 part urine with either 9 parts water or 99 parts water (at ROOM TEMPERATURE) and multiply the result (ie. amount of Vitamin C in mg) by either 10 or 100 respectively to calculate the actual result. For example, if you dilute your sample with 9 parts water, and you count 3 seconds to find the result on the BLACK curve is 440mg, multiply this by 10 to find that your urine's Vitamin C level is 4,440mg per 100mL of urine.

It is felt, by Stone<sup>(1)</sup>, Kalokerinos<sup>(2)</sup>, Dettman<sup>(3)</sup>, and others, that there should occur a significant spillover of Vitamin C into the urine for optimum health, and that any result below 10mg/100mL of urine must be considered in what they term the "low range". These ranges are pointed out on the chart below.



**References:**

1. Stone, I. et al. (1974) *The Healing Factor* Publ. Grosset & Dunlap
2. Kalokerinos, A. (1974) *Every Second Child* Keats Publishing
3. Dettman, GC. et al. (1993) *Vitamin C - Nature's Miraculous Healing Missile* Publ. Frederick Todd Melbourne



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www.biologcaltherapies.com

**TGA Licenced Manufacturer**

Suite 5, 20-30 Malcolm Road, Braeside VIC 3195

PO Box 702, Braeside VIC 3195, Australia

Tel +61 3 9587 3948

Fax +61 3 9587 1720

Email [biol@biol.com.au](mailto:biol@biol.com.au)

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