NEWS, VIEWS, & REVIEWS

A Tool for My Laser Practice I Simply Can't Do Without: Shining a Light on My Favorite Light (Source)

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ABSTRACT

With laser surgery, what you see is what you get. Visualizing the target for treatment, be it a port-wine stain, a cluster of spider veins, a tattoo or freckles, or simply photodamaged skin requires seeing through surface reflections, dry skin, and often quite dark laser goggles. The tool that has been indispensable to me in my practice is the Syris v900L polarizing and magnifying headlamp. This indispensable tool makes laser treatment more precise, effective, and easier by truly shining a light on the subject of a laser treatment. Future uses of this dynamic, yet simple invention, should be found in all of dermatology and beyond, anywhere that seeing what you are looking at more clearly is important.

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Every laser practitioner has a tool they simply cannot do without. If it's left at a satellite office or gets misplaced, then it's going to be a stressful day. For me that device is the Syris Scientific v900L, formerly known by the much cooler name of the Seymour Light, because it truly allows physicians to SEE MORE than they could ever see with even the best external lighting. It all began with three of my favorite people, who also happen to be world-class photobiologists, back in the early 1990s. In July of 1991, R. Rox Anderson, MD, described the use of polarized light in dermatology in an article in *Archives of Dermatology* called "Polarized Light Examination and Photography of the Skin." (*Arch Dermatol* 1991; 127:1000-1005). Then in 1997 Rox Anderson, Nik Kollias, and Bill Farinelli developed the first patented, polarized hands-free headset; known as the Seymour Light (Figure 1). This first commercial iteration of a head lamp that incorporated the very simple (once one has seen it or heard about it) concept of using 2 polarizers that can be oriented at different angles to one another, and are positioned between the observer and a light source, providing illumination and magnification with continuous options for polarization. One polarizer is directly in front of a bright halogen bulb, and this polarizer can be rotated 90 degrees by the user. The other polarizer is fixed and is in front of a plastic viewing-shield, which contains magnifiers of various selected strengths.

One who wears polarized sun glasses has probably had the experience of looking at controls in a car that are covered by a plastic lens, or a computer screen with a plastic covering, and found that the screen goes from visible to poorly-visible, to opaque, when turning one's head to change the orientation of the polarizing sun glasses. A polarizer only transmits light waves of a particular orientation, or polarization, to come through. This simple example illustrates that combining 2 polarizers of opposite orientations will eliminate all light coming from a particular source, and rotating one's head to change the orientation of one's sun glasses relative to a computer screen or automobile display will allow varying amounts of visibility depending upon the relative orientation of the 2 polarizers, from complete visibility when the orientation of the polarizers are parallel to one another (parallel-polarized), to no visibility when the polarizers are at right angles to one another (cross-polarized).

This concept is exploited for photography, especially dermatologic photography, when trying to highlight various features of the skin. When photographing spider veins, pigmentation, tattoos or any cutaneous feature below the stratum corneum or very superficial epidermis, cross-polarized flash photography is used to expose an unseen world beneath the skin surface, eliminating surface shadows and reflections or glare. Typically, a polarizer is placed in front of the flash and another is placed at right angles to it in front of the lens (Figure 2). This is analogous to the cross-polarized position with the Syris light. When highlighting surface features one removes the polarizer for plain flash photography, or with the Syris light, turns the movable polarizer so that it is parallel to the fixed polarizer in front of the viewing window.

FIGURE 1. (A) Photograph of the new Syris v900L, LED and battery operated, cross-polarizing headlamp. The accompanying battery pack is worn on a belt loop, waistband, or in a pocket and is lightweight and lasts an entire day. (B) The original Seymour light being used by the author during a laser treatment with the pulsed-dye laser. (C) The Syris v900L being worn by the author.

(A)

(B)

(C)

FIGURE 2. (A) A cross-polarizer in the cross-polarized setting covering the lens. One circular polarizer covers the lens opening, while the others, which are polarized at right angles to the lens polarizer, cover the ring flash surrounding the lens opening. (B) The polarizer is removed from the front of the lens enabling plain flash photography without cross-polarization.

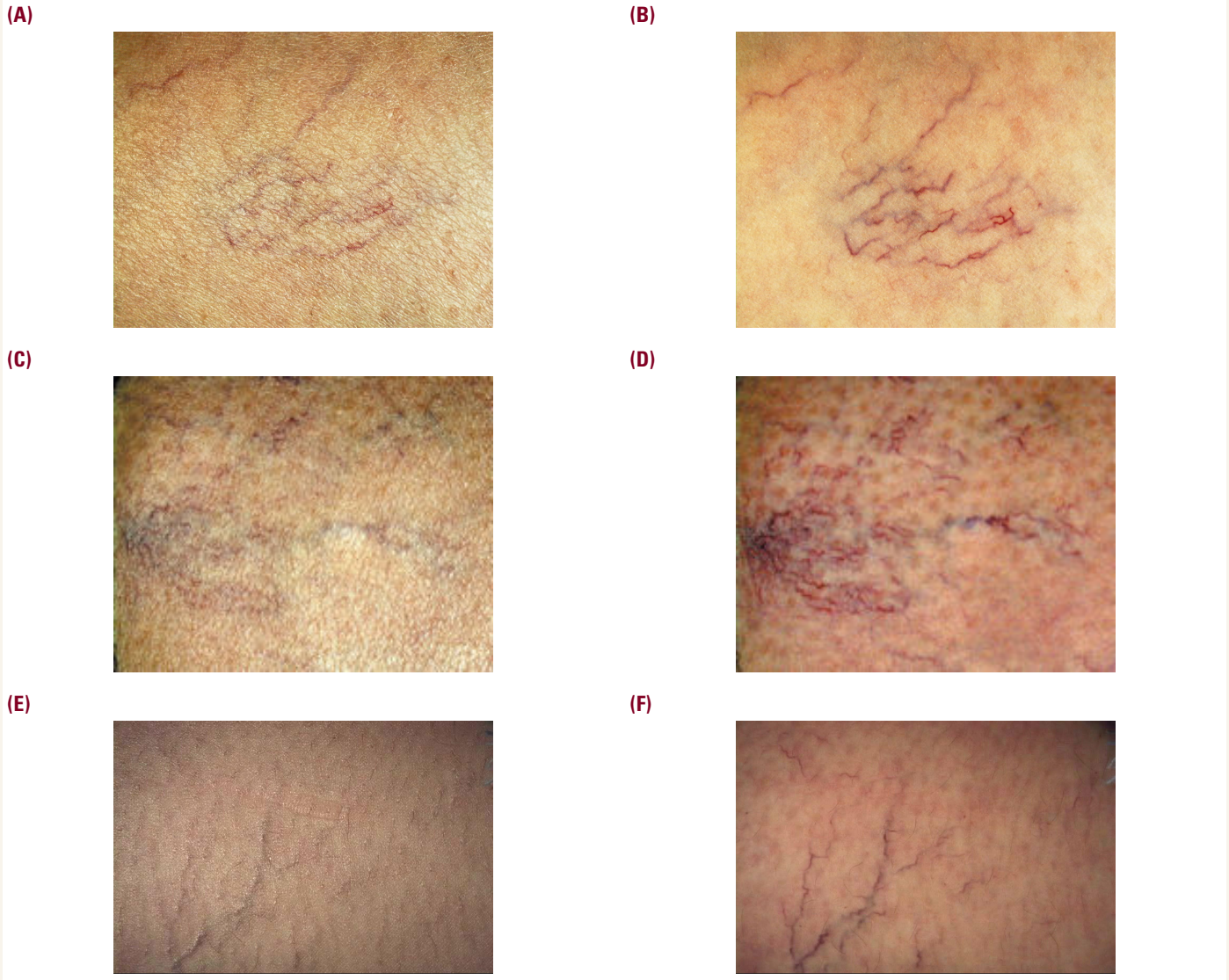
(A)

(B)

In 1999, Syris Scientifics' engineering and manufacturing team evolved the Seymour Light technology and developed the v600 and the v300, which were lightweight vision-enhancement illuminators that are worn as a headlamp and attached to a power cord and transformer. These lights were sufficiently bright to enable visualization of pigmentation and vascularity through laser-protective eyewear, and have become a staple for busy laser surgeons around the world. This author exclusively uses the Syris lights to the exclusion of all others, and has a conference room filled with unused medical floor lamps.

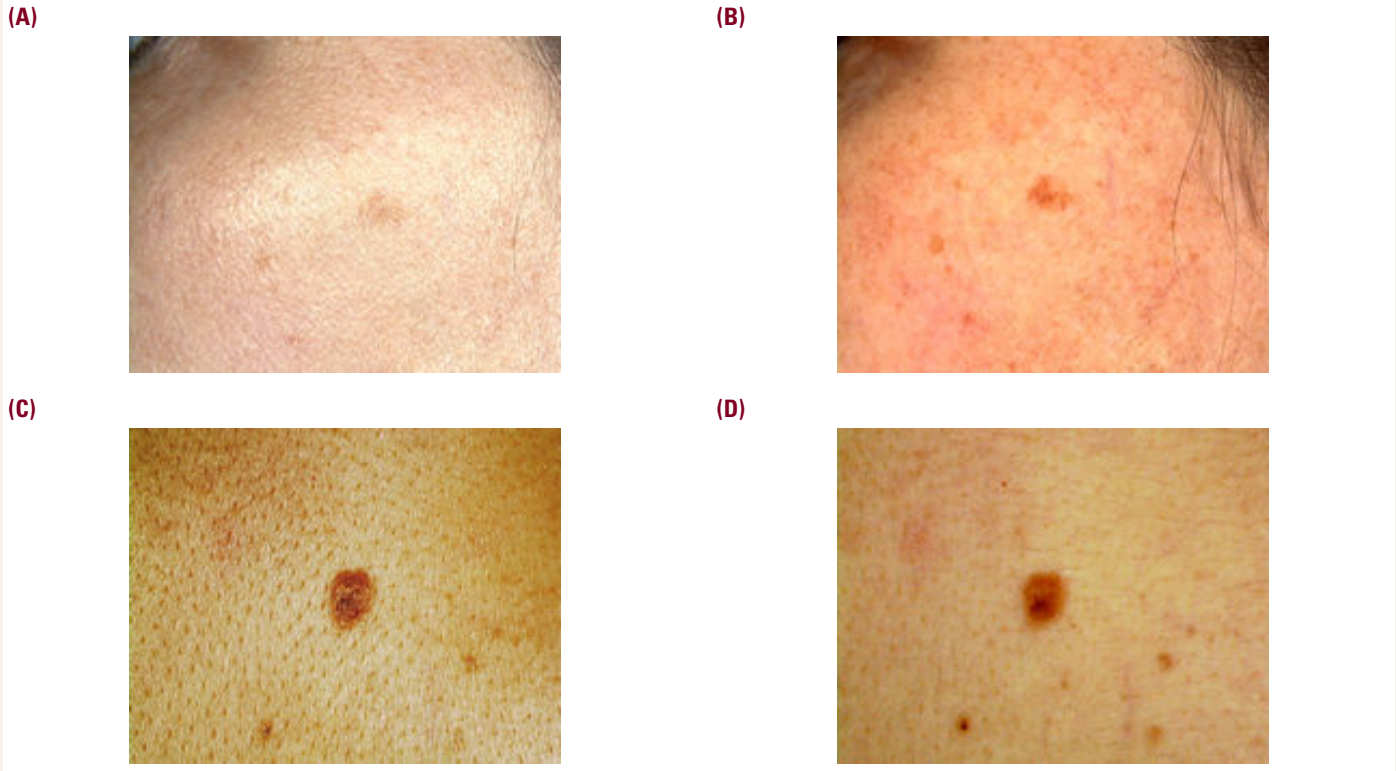
The most common use for the Syris light by dermatologic laser surgeons is in visualization of vascular lesions during laser treatment (Figure 3). However, the Syris light is an indispensable tool for visualizing any lesion being viewed by a dermatologist, or target of laser treatment. Freckles, lentigos, nevus of Ota/Ito, melasma, and any other pigmented epidermal or dermal lesions are extremely easily visualized, no matter what the overlying stratum corneum looks like (Figure 4). In addition, inflammatory conditions may be viewed for surface and sub-surface characteristics in real time with turn of the polarizer (Figure 5), potentially aiding in a diagnosis by immediately

FIGURE 3. (A, C, E) Normal lighting view of spider veins using the Syris light, as compared to cross-polarized view (B, D, F).



being able to highlight surface, and sub-surface features. As for the Syris light's most common use, treating vascular lesions with lasers or sclerotherapy, it is simply indispensable. Linear telangiectasias appear to jump out at the observer using the Syris light in cross-polarizing mode (Figure 3). Under normal visualization using halogen operating-room lights, only the larger vessels are seen. When donning the Syris light, numerous heretofore unseen capillaries, veins, and diffuse redness appear instantaneously. This cross-polarizable, magnifying headlamp is essential when treating linear telangiectasias on the face, legs, or anywhere on the body. In addition, the extent of diffuse redness or pigmentation is easily seen when using the cross-polarized setting of the Syris light. Port-wine stains which are becoming faint can often be difficult to visualize after a number of treatments, but are easily outlined with white eyeliner pencil when using the Syris polarizing headlamp. The same is true when trying to find numerous nevus araneuses or cherry angiomas in a sea of nevi or ephiledes. Distinguishing between even tiny vascular and pigmented lesions is much easier when using the Syris light. Tattoos are also made extremely highly visible, even on dry skin, with the Syris light. Cross-polarization using the Syris light enables not only visualization of the numerous colors that can be within a tattoo, but also the presence of white pigment, which can turn gray after laser treatment and may not then come out with subsequent laser treatments. The Syris light enables visualization of subtle, or hidden, white pigment that is often mixed with other pigments, or used very sparingly in tattoos. In addition, tattoos that are overlain by a cover-up tattoo can be visualized, preparing the physician for its emergence once treatment commences.

FIGURE 4. (A, C) Visualized with the Syris light in parallel-polarized mode showing surface features, and (B, D) in cross-polarized mode demonstrating variations in color more clearly.

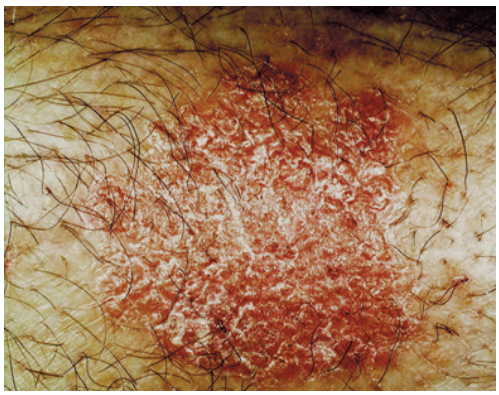


Perhaps the biggest advantage of the Syris light is the ability of cross-polarized visualization to enable visualization of pigmented lesions within areas of the skin where they would normally be hidden, even when viewed with magnification and strong halogen, operating-room lighting. On numerous occasions, I have seen pigmented lesions within darker port-wine stains, severe rosacea (Figure 6), and even within tattoos of all colors, where their visualization would be nearly impossible without using the Syris light (Figure 7). Pigmented lesions are obvious even within skin that is severely inflamed from inflammatory conditions. The 'odd-duck' lesion is much easier to identify using the cross-polarizing feature of the Syris light, and one can quickly, in about a second, switch from cross-polarizing, sub-surface viewing to parallel-polarizing, surface visualization with literally a turn of the wrist. This enables one to see the surface epidermal features of a lesion, and quickly transition to sub stratum corneum features, such as pigmentation and vascularity, to enable much faster characterization of the lesion in question. There is, to my knowledge, no other device that enables viewing the epidermal 3-dimensional characteristics of a skin lesion, and then immediately enables cross-polarized viewing of pigment and vascular variations, or in the case of tattoos, allows one to discern even very subtle color characteristics and enables visualization of even very small pigmented lesions within a sea of tattoo pigment, so quickly or over such a large area. In addition, lesions may appear to be 'odd-ducks' with the Syris light, and not with the naked eye or even standard magnification. For example, when visualizing a large nevus spilus, a lentigo within it may 'jump out' upon cross-polarizing visualization, or areas of darker pigment may be apparent, that were not on standard illumination, even with substantial magnification. Viewing the skin in cross-polarized mode, parallel polarized mode, or anywhere in between is enabled real-time while wearing the light on one's head, making exams as quick and simple as viewing with the naked eye or a standard illuminator.

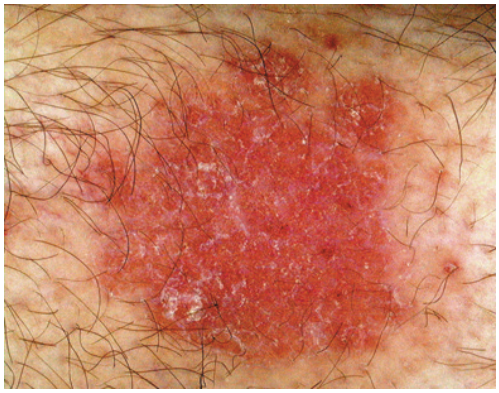
The Syris light is not FDA-cleared as a diagnostic tool, and new users should use this device to augment their standard exam by using it to identify lesions that otherwise might not get further scrutiny, thus resulting in a closer look with one's standard techniques, including dermoscopy. I can say without a doubt in my solely laser surgery practice, that using the Syris light has enabled me to identify suspicious lesions requiring further biopsy or treatment in a substantial number of instances, even in patients sent by dermatologists and other practitioners for laser treatment following a skin examination. I have also identified previously unnoticed lesions that require examination,

FIGURE 5. Psoriasis pictured with parallel-polarization showing surface features (A), and cross-polarized (B) showing vascularity and the sub-surface appearance.

(A)



(B)



biopsy or other interventions when using the Syris light to visualize lesions or conditions I am targeting with laser treatment, such as tattoos, PWSs, or unwanted hair, prior to laser treatment.

In conclusion, the Syris v900L variably-polarizable headlamp is my most indispensable tool, and has been so for almost 2 decades, starting as the lovingly-named Seymour Light, and progressing to the serious-sounding v900L. The v900L is the newest iteration of the Syris light, and is a major advance in usability and convenience. It incorporates an LED light source and thus draws less power than standard halogen bulbs, enabling new and significantly more efficient batteries to power the v900L for an entire day without re-charging, even in my purely-laser practice. The lightweight battery pack goes unnoticed on a belt loop or in a pocket, and allows the user to go from patient to patient untethered. This is a major convenience, especially when performing laser surgery with the surrounding tethered foot pedals, power cords, and actual laser devices, which may become tangled with a headlamp that is connected to a transformer and plugged into an outlet. Future studies should focus on expanded use of the Syris v900L for increasing diagnostic accuracy when evaluating pigmented lesions or

FIGURE 6. A patient with severe rosacea sent for laser treatment. On examination with the Syris v900L headlamp using cross-polarized visualization, a pigmented lesion was seen and the patient sent for evaluation of this and treatment prior to laser treatment. This was an in-situ melanoma. Show are normal lighting (left) and cross-polarized lighting (right).

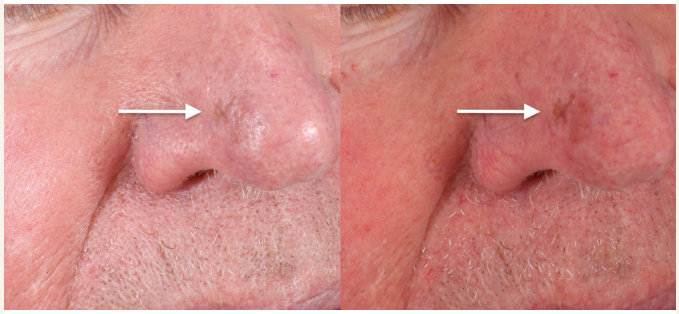
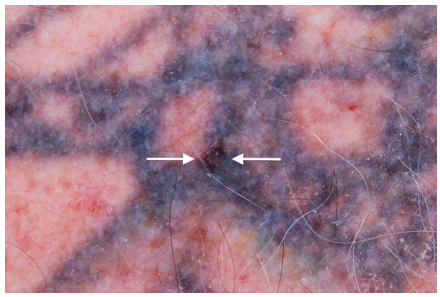


FIGURE 7. A patient presenting for laser tattoo removal (A) was seen to have a pigmented lesion within his tattoo, that wasn't initially noticed until visualized with cross-polarized lighting and magnification with the Syris light (B). It was removed and identified as a dysplastic nevus prior to laser treatment.

(A)

(B)



diagnosing inflammatory conditions in dermatologists' or other practitioner's offices, where rapidly changing from surface to sub-surface features can be an indispensable aid to diagnosis. In addition, use of the Syris light should be explored more fully in other fields outside of dermatology and laser surgery, including: dentistry, ophthalmology, and surgery and its numerous sub-specialties.

Disclosures

The authors have no financial interest with Syris Scientific and no other relationships to disclose.

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