New UV filters' secret: Photostability and broad-spectrum action

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> For two decades, the US Food and Drug Administration maintained a static list of approved sunscreen active ingredients, leaving clinicians and patients with limited options compared to global markets. This regulatory inertia meant that while Europe and Asia benefited from advanced UV filters, American consumers relied on formulations largely unchanged since the 1990s. Now, the FDA has finally expanded its approved list, a move that promises to reshape the landscape of photoprotection.

KEY TAKEAWAYS

- The Pivot: The FDA approved two new UV filters, bemotrizinol and bisoctrizole, for use in sunscreens, ending a 20-year freeze on new active ingredients.
- The Data: These filters offer broad-spectrum protection and photostability, addressing limitations of older ingredients.
- The Action: Clinicians should now counsel patients on the availability of sunscreens with these new filters, emphasizing their enhanced broad-spectrum protection and potential for improved cosmetic elegance.

The FDA's decision to clear bemotrizinol and bisoctrizole for use in over-the-counter sunscreens represents a significant shift in US dermatologic public health. These two chemical filters, widely available and proven safe in other parts of the world for years, offer broad-spectrum protection against both UVA and UVB radiation. Their approval means US consumers will finally have access to more effective and cosmetically appealing formulations, potentially improving adherence to photoprotection guidelines.

Bemotrizinol (also known as Tinosorb S) and bisoctrizole (Tinosorb M) are organic UV filters. They function by absorbing and scattering UV radiation, converting it into heat. Unlike some older chemical filters, these newer compounds are known for their photostability, meaning they do not degrade significantly when exposed to sunlight, maintaining their protective efficacy for longer periods. This stability is a key advantage, as it reduces the need for frequent reapplication solely due to ingredient breakdown.

The science behind the new filters

Bemotrizinol, a lipophilic triazine derivative, provides excellent broad-spectrum protection, particularly in the UVA range (320-400 nm), which is crucial for preventing photoaging and reducing the risk of skin cancer. It also shows strong absorption in the UVB range (290-320 nm). Its molecular structure contributes to its high photostability and its ability to act as a photostabilizer for other UV filters in a formulation. This synergistic effect can enhance the overall efficacy and longevity of a sunscreen product.

Bisoctrizole, a hybrid filter, combines both organic and inorganic properties, allowing it to absorb, reflect, and scatter UV radiation. It offers very broad-spectrum protection, covering both UVA and UVB effectively. Its particulate nature means it often appears as a white, micronized powder in formulations, contributing to a more elegant feel than traditional inorganic filters like zinc oxide or titanium dioxide, which can leave a noticeable white cast. This cosmetic benefit is not trivial; it directly impacts patient compliance.

The FDA's previous stance on new sunscreen ingredients was rooted in a requirement for extensive safety data, treating them as new drug applications rather than cosmetic ingredients. This regulatory hurdle effectively stifled innovation for two decades, leaving the US market lagging behind Europe, Australia, and Canada, where these filters have been in use for years. The approval process for these specific filters involved a comprehensive review of existing international safety data and new submissions, ultimately satisfying the FDA's stringent requirements for systemic absorption and potential endocrine disruption.

But the approval is not a blanket endorsement of all pending filters. Several other UV filters, also widely used internationally, remain under FDA review. The agency continues to demand robust data on systemic absorption and potential long-term effects for each ingredient. This cautious approach, while ensuring safety, still means that the US market will not immediately catch up to the full range of options available elsewhere. Clinicians should be aware that while two new options are welcome, the regulatory pipeline remains slow.

The cosmetic elegance of sunscreens containing bemotrizinol and bisoctrizole is a practical benefit for patients. Older chemical filters, while effective, sometimes caused irritation or had less desirable textures. The new filters allow for lighter, less greasy formulations that integrate better into daily skincare routines, particularly for facial use. This improved user experience can translate directly into more consistent application, a critical factor in effective photoprotection. For a comprehensive guide to managing various skin conditions, the Oxford Handbook of Medical Dermatology remains an invaluable resource.

The long-term impact of this regulatory change will depend on how quickly manufacturers incorporate these new filters into their product lines and how effectively clinicians educate patients on their benefits. While the approval of two filters is a step forward, the broader challenge of ensuring comprehensive photoprotection for all patients, particularly those at high risk for skin cancer, persists. The FDA's continued scrutiny of other filters means further expansions will likely be incremental, not revolutionary.

CLINICAL IMPLICATIONS

The FDA's approval of bemotrizinol and bisoctrizole is a long-overdue acknowledgment that US sunscreen formulations needed an upgrade. For clinicians, this means new tools to recommend, particularly for patients who struggle with the cosmetic acceptability or efficacy of older zinc oxide and titanium dioxide formulations. The enhanced photostability and broad-spectrum coverage of these new filters offer a genuine advantage in preventing UV-induced damage.

But this is not a panacea. The regulatory process remains cumbersome, and the US still lags behind international standards in terms of available UV filters. Clinicians should continue to emphasize the importance of comprehensive photoprotection strategies, including seeking shade, wearing protective clothing, and consistent application of sunscreen, regardless of the specific active ingredients. No single sunscreen

> ingredient, new or old, replaces these fundamental practices.
> The industry will now need to innovate, bringing these new formulations to market at accessible price points. Patient education will be key; many may not understand the difference between older and newer filters. GPs and dermatologists have a role in explaining the benefits of these advanced options, particularly for patients with a history of photodamage or skin cancer. This regulatory shift provides an opportunity to reinforce the message that effective sun protection is a critical component of long-term skin health.