Advanced sleep phase is often seen in individuals who have difficulty staying awake until their desired bedtime in the evenings and have problems staying asleep in the early morning.

Measuring melatonin patterns at bedtime is an important tool for the assessment of sleep issues including problems staying asleep and falling asleep. Dim Light Melatonin Onset (DLMO) is a specific rhythm of evening melatonin secretion tied to promoting the onset of sleep in healthy individuals. This test allows the visualization of this biological pattern to see if it is abnormal or shifted. The pattern, or sleep phase, is interpreted by identifying the time at which the rising melatonin levels cross a certain threshold. The DLMO threshold on the report is calculated as the average of the first three patient baseline samples plus two standard deviations. The results can be used to find appropriate therapies and create specifically timed application of treatments. If an imbalance is found, some therapies to consider include light therapy and exogenous melatonin supplementation.

Light exposure during collections will significantly lower melatonin levels and patient compliance to all test instructions is crucial for accurate test results.
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Dim Light Melatonin Onset (DLMO) Rhythm

Sample # | Habitual Sleep Time (Hours) | Sample Collection Time | Melatonin (pg/mL)
--- | --- | --- | ---
1 | -5.0 hrs | 6:00 PM | 5.0
2 | -4.0 hrs | 7:00 PM | 6.0
3 | -3.0 hrs | 8:00 PM | 7.0
4 | -2.0 hrs | 9:00 PM | 8.0
5 | -1.0 hrs | 10:00 PM | 19.0
6 | Sleep Onset | 11:00 PM | 22.0
7 | +1.0 hrs | 12:00 AM | 27.0
8 | +2.0 hrs | 1:00 AM | 27.0

DLMO Phase Interpretation *

<table>
<thead>
<tr>
<th>DLMO Threshold (pg/mL)</th>
<th>Approximate DLMO threshold is crossed between:</th>
<th>Sleep Phase:</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0</td>
<td>9:00 PM-10:00 PM</td>
<td>Normal</td>
</tr>
</tbody>
</table>

* DLMO Threshold estimation is calculated based on the patient's own baseline measurements (3-5 hours before bedtime). This variable threshold method accommodates patients who do not secrete high enough concentrations of melatonin to cross a fixed threshold in addition to those who have daytime measurements above a fixed threshold.

Some sleep disturbances are non-circadian sleep disorders and may not be directly tied to a sleep phase shift. Normal Sleep Phase results need to be considered in the context of the patient’s overall presentation and available diagnostic data.

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Incorrect sample handling may affect results. Results are not intended to diagnose, treat, cure, or prevent any disease or replace medical advice from a qualified health care provider.
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Measuring melatonin patterns at bedtime is an important tool for the assessment of sleep issues including problems staying asleep and falling asleep. Dim Light Melatonin Onset (DLMO) can be shifted due to factors such as circadian rhythm disorders or changes in light exposure. If an imbalance is found, some therapies to consider include light therapy and exogenous melatonin supplementation.

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**In cases where the threshold is never crossed by the patient melatonin line, such as with flat-lined results or an atypically elevated threshold, the interpretation of sleep phase cannot be provided. An atypically elevated threshold can occur when one or more of the first three patient baseline values are abnormally elevated, as these values are used to calculate the DLMO threshold. Retesting is recommended for accurate results, ensuring careful adherence to test instructions.**

Light exposure during collections will significantly lower melatonin levels and patient compliance to all test instructions is crucial for accurate test results.