Saturday September 26th, 8:30 am to 11:30 am

Fast Curing with High Power Curing Lights: Is this a Good Idea?

Dr. Richard Price

Dr. Richard Price BDS, DDS, MS, FRCD(C), FDS (Edin), PhD received his BDS from the University of London in 1979 and his DDS from Dalhousie’s Faculty of Dentistry in 1988. He completed his MS in Restorative Dentistry at the University of Michigan in 1984 and his PhD at the University of Malmö, Sweden in 2001. Dr. Price is the inventor of the MARC system for teaching effective light curing and is actively involved in research on dental resins and dental curing lights. Dr. Price also works as a Prosthodontist in the Faculty of Dentistry practice at Dalhousie University. He has made numerous CDE presentations and has also been author of more than 100 peer-reviewed articles. As a recognized leading international expert in light curing he recently organized a symposium on Light Curing in Dentistry at Dalhousie University that was attended by over 40 Key Opinion Leaders.

Course Outline

Curing Lights, They are All the Same, Aren’t They?

The use of light-cured, resin composites is increasing and will only continue to increase with the worldwide agreement to phase down the use of amalgam. Consequently, the selection of a light-curing unit and how it is used are important factors. However, dentists and dental assistants are not well trained in the art and science of light curing. In most cases, the only instruction given is the duration of curing, e.g., “light cure for 10 seconds.”

This presentation will review the terms used when describing curing lights and describe the desirable properties in a curing light. Clinical tips to improve your light curing technique will be described.
Tips for Success based on Halifax 2014 Symposium on Light Curing

**Clean** and inspect tip, **Apply barrier**

**Check** light is set to correct mode and time according to manufacturer’s instructions

- **Shade** | **Seconds**
  - A1 | 10
  - A2 | 15
  - A3 | 20
  - B1 | 10
  - B4 | 30

Verify access to restoration  
**Position** light to minimize thermal damage to soft tissue, air cool

**Wear Eye Protection**,  
**Stabilize** tip,  
**Watch** position of curing light

**Cover** restoration with tip  
**Position** tip near restoration  
if $\geq 5$mm distance, increase exposure time

**Keep tip close to restoration**  
Light cure restoration for **Recommended Time**

**Clean** and disinfect unit  
**Check** output regularly

Dr. R. Price_Nov. 2014_rbprice@dal.ca
## Tips To Help You Choose Your Next Curing Light in 2015

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the light appear robust?</td>
<td>Does it come with support, contact information, and a warranty?</td>
</tr>
<tr>
<td>Has the light been independently tested and approved?</td>
<td></td>
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<tr>
<td>When measured accurately, does the light deliver at least 500 mW/cm² in standard mode?</td>
<td>Until more clinical studies are available, be wary of lights delivering &gt; 2,000 mW/cm² and offering short exposure times, unless they are matched to a specific resin system.</td>
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<tr>
<td>Will the light from the curing light tip cover most of your restorations, or will overlapping exposures be required?</td>
<td>Ideally light manufacturer should show that their light delivers a wide and uniform light output without irradiance ‘hot’ or ‘cold’ spots.</td>
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<tr>
<td>Ask the resin manufacturer if a single peak LED curing light is sufficient, or if a broad spectrum multi-peak curing light would be beneficial?</td>
<td>SINGLE PEAK (all blue LEDs) activates camphorquinone</td>
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### Irradiance = Power/Area

A low power (Watts) light can still deliver a high irradiance (mW/cm²) if a small tip is used.

**Decreasing tip diameter by 3 mm increases the average irradiance by 2.25 x**

### Choose a light that reports the reduction in irradiance as the distance from the tip increases.

**Need to know the effect of distance on irradiance.**

**Table on the right provides a guide showing how long you must increase exposure time to compensate for a drop in irradiance as distance between light tip and resin increases.**

<table>
<thead>
<tr>
<th>Recommended Exposure Time At 100% Output</th>
<th>Exposure Time Necessary if Irradiance Has Dropped By</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 s</td>
<td>25%</td>
</tr>
<tr>
<td>13 s</td>
<td>50%</td>
</tr>
<tr>
<td>20 s</td>
<td>75%</td>
</tr>
<tr>
<td>40 s</td>
<td></td>
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