




## Low Level Laser Therapy (LLLT) Protocol Calculation: Dose-Time Table

Condition:	<b>Alopecia; Hair Loss</b>		
LD Wavelength:	<b>655 ~ 660 nm</b>		
LD Power:	P	<b>17.3 ~ 250 mW</b>	
Frequency:	Continuous		
Target Dose:	D	3 J/cm <sup>2</sup>	Bald Area
		1.5 J/cm <sup>2</sup>	Risky (Shedding) Area
		0.5 J/cm <sup>2</sup>	Normal Area
Treatment Sessions:	3	Time/Week (1st 4 weeks)	
	2	Time/Week (After 4 weeks)	
Power Density:	I	I (W/cm <sup>2</sup> ) = P (mW) / 1000 / A (cm <sup>2</sup> )	
Irradiated Energy	E	E (Joule) = P (mW) / 1000 x T (Second)	
Cal. Treatment Time:	Tc	<b>Tc (Second) = D (J/cm<sup>2</sup>) x A (cm<sup>2</sup>) / P (mW) x 1000</b>	
Cal. Total Treatment Time:	Ta	<b>Ta (Second) = Tc (Second) x A1 (cm<sup>2</sup>) / A (cm<sup>2</sup>)</b>	

<b>Device:</b>		<b>Aculas®-HB-850A</b>								
<b>LD Wavelength:</b>		<b>660 nm</b>								
<b>Total LD Power:</b>		<b>100 mW</b>								
<b>Energy Irradiated in 15 Minutes:</b>		<b>90 Joule</b>								
<b>Estimated Scalp Area:</b>		<b>150 cm<sup>2</sup></b>								
Area	Scalp Area		Laser Effective Area	CW Power	Power Density	Target Dosage	Target Energy	Calculated Treatment Time		Calculated Total Treatment Time
	A1		A	P	I	D	E	Tc		Ta
	%	(cm <sup>2</sup> )	(cm <sup>2</sup> )	(mW)	(W/cm <sup>2</sup> )	(J/cm <sup>2</sup> )	(Joule)	(Sec.)	(Min.)	(Min.)
Bald	25%	37.5	22	100	0.00455	3	113	660	11.0	18.8
Risky	25%	37.5				1.5	56	330	5.5	9.4
Normal	50%	75.0				0.5	38	110	1.8	6.3
<b>Total Treatment Time</b>										<b>34.4</b>

<b>Device:</b>		<b>Aculas®-HB-850B</b>								
<b>LD Wavelength:</b>		<b>660 nm</b>								
<b>Total LD Power:</b>		<b>250 mW</b>								
<b>Energy Irradiated in 15 Minutes:</b>		<b>225 Joule</b>								
<b>Estimated Scalp Area:</b>		<b>150 cm<sup>2</sup></b>								
Area	Scalp Area		Laser Effective Area	CW Power	Power Density	Target Dosage	Target Energy	Calculated Treatment Time		Calculated Total Treatment Time
	A1		A	P	I	D	E	Tc		Ta
	%	(cm <sup>2</sup> )	(cm <sup>2</sup> )	(mW)	(W/cm <sup>2</sup> )	(J/cm <sup>2</sup> )	(Joule)	(Sec.)	(Min.)	(Min.)
Bald	25%	37.5	22	250	0.01136	3	113	264	4.4	7.5
Risky	25%	37.5				1.5	56	132	2.2	3.8
Normal	50%	75.0				0.5	38	44	0.7	2.5
<b>Total Treatment Time</b>										<b>13.8</b>

<b>Device:</b>		<b>Klas®-S50</b>								
<b>LD Wavelength:</b>		<b>660 nm</b>								
<b>Total LD Power:</b>		<b>50 mW</b>								
<b>Energy Irradiated in 15 Minutes:</b>		<b>45 Joule</b>								
<b>Estimated Scalp Area:</b>		<b>150 cm<sup>2</sup></b>								
Area	Scalp Area		Laser Effective Area	CW Power	Power Density	Target Dosage	Target Energy	Calculated Treatment Time		Calculated Total Treatment Time
	A1		A	P	I	D	E	Tc		Ta
	%	(cm <sup>2</sup> )	(cm <sup>2</sup> )	(mW)	(W/cm <sup>2</sup> )	(J/cm <sup>2</sup> )	(Joule)	(Sec.)	(Min.)	(Min.)
Bald	25%	37.5	3	50	0.01667	3	113	180	3.0	37.5
Risky	25%	37.5				1.5	56	90	1.5	18.8
Normal	50%	75.0				0.5	38	30	0.5	12.5
<b>Total Treatment Time</b>										<b>68.8</b>

Device: **HairMax® SE**

**LD Wavelength:** 655 nm  
**Total LD Power:** 17.3 mW  
**Energy Irradiated in 15 Minutes:** 15.57 Joule  
**Estimated Scalp Area:** 150 cm<sup>2</sup>



Area	Scalp Area		Laser Effective Area	CW Power	Power Density	Target Dosage	Target Energy	Calculated Treatment Time		Calculated Total Treatment Time
	A1		A	P	I	D	E	Tc		Ta
	%	(cm <sup>2</sup> )	(cm <sup>2</sup> )	(mW)	(W/cm <sup>2</sup> )	(J/cm <sup>2</sup> )	(Joule)	(Sec.)	(Min.)	(Min.)
Bald	25%	37.5	0.42	17.3	0.04119	3	113	73	1.2	108.4
Risky	25%	37.5				1.5	56	36	0.6	54.2
Normal	50%	75.0				0.5	38	12	0.2	36.1
<b>Total Treatment Time</b>										<b>198.7</b>

Device: **HairMax® Premium**

**LD Wavelength:** 655 nm  
**Total LD Power:** 35 mW  
**Energy Irradiated in 15 Minutes:** 31.5 Joule  
**Estimated Scalp Area:** 150 cm<sup>2</sup>



Area	Scalp Area		Laser Effective Area	CW Power	Power Density	Target Dosage	Target Energy	Calculated Treatment Time		Calculated Total Treatment Time
	A1		A	P	I	D	E	Tc		Ta
	%	(cm <sup>2</sup> )	(cm <sup>2</sup> )	(mW)	(W/cm <sup>2</sup> )	(J/cm <sup>2</sup> )	(Joule)	(Sec.)	(Min.)	(Min.)
Bald	25%	37.5	0.42	35.0	0.08333	3	113	36	0.6	53.6
Risky	25%	37.5				1.5	56	18	0.3	26.8
Normal	50%	75.0				0.5	38	6	0.1	17.9
<b>Total Treatment Time</b>										<b>98.2</b>