DataLink Alcon Edition
Surgical Planning Tutorial

SurgiVision® Consultants, Inc.
September 1, 2010
Caution!

• Surgical planning requires considerable insight and should only be performed by the operating surgeon

• The End User License Agreement / Terms and Conditions of Use require the surgeon to create surgical plans
  – Data entry may be delegated, surgical planning may not
DataLink Alcon Edition

This is a web-based program, which means that

- You do not have to install or update any software

- You do have to remember
  - The link to find the software: www.SurgiVision.net
  - Your login information (provided by SurgiVision®)
  - Your encryption key, used to encrypt patient-identifying data

- Save a “Shortcut” to the site on your computer desktop!

- You can access it from any up-to-date online computer
  → Firewall and network must allow access

- You will need a HIGH SPEED Internet access to use it effectively

- Data are stored in a central server

- All transactions are logged to protect the data

- Data are encrypted with banking-level security
Functional Requirements

- Microsoft Internet Explorer Version 6.0 or higher
  - If using proxy server, must enable access to http://svc.surgivision.net
  - Enable popups for this site
  - Depending on firewall, may need to add site to “Trusted Internet Sites” in Browser Options
    - Site to add is https://svc.surgivision.net
The DataLink Alcon Edition sorts at the top of the list of programs. Click “Data Entry and Surgical Planning” to enter the program.

SurgiVision® Home Page
www.SurgiVision.net
Login Page
Popups MUST be enabled to use this program!

If the program doesn’t respond, it is probably because of a popup blocker
Encryption Key

- All data sent in DataLink use “secure socket layer” like banks
- Patient-identifying information is encrypted before being sent, using your “Key”
- These data are stored encrypted in the servers
- Patient names are not unencrypted – privacy is ensured
A summary of your data is shown on the home page.

Click the bar graphs to see more detail about the underlying data.
Interactive tables “Drill Down” to show more detail
The program relies on postoperative data to provide nomograms.

Postop data is also required for subscription renewal.

When you log in to create Surgical Plans, always check the number of eyes with postops:

- It should continuously increase.

Note that the postop exam must be “qualified” for use in nomogram processing to be counted:

- 21 days after surgery or later for LASIK
- 75 days after surgery or later for Surface Treatments
Exam reports can assist in locating patients with missing data
Preferences for vertex distance, plus/minus cylinder notation, etc. are set under “Manage My Practice”
Making DataLink Work for You

• DataLink will SPEED your clinic, not slow it down
  • Surgical planning is faster and more accurate using DataLink
  • Enhancement rates can be significantly reduced, saving a great deal of time
• Use our forms to capture data from your charts
  • The Summary Data Entry Form provided with the program under the Resources tab
  • It is also available at http://AlconSummary.SurgiVision.net
• See suggestions for improving efficiency at this link
  • http://AlconBestPractices.SurgiVision.net
Key Efficiency Pearls

• Capture data from your charts using our paper forms
  • For EMR users, create a screen to match the form layout
• Write info on the form as you see the patient
  • This saves time and reduces errors
• Have the laser tech enter data into DataLink as you do your cases
• Remove the DataLink paper form from the chart after the postop exam, and put it in a queue for data entry
  • This way the techs don’t have to hunt for charts to find the data
  • They just pick up the forms and go
Click to open the Summary Data Entry Form
This form captures all the information required for the program and is designed to speed up data entry. Complete the form as the patient goes through the system and “batch” enter data from the forms, NOT from the charts. Doing this avoids having to pull charts to enter data. The form can be quickly completed as you see the patient – saving time!
The program highlights eyes with probable data entry errors as “Outliers”.

Outliers should be corrected or “validated” if the data are correct.

There should never any outliers – if there are, speak to your data entry personnel.
Use these links to navigate within the program
Surgical Planning

- Because surgical planning is available online, you can create plans from anywhere you have internet access (home, laser center, etc.)
- Surgical planning is not data entry - that can be done by your staff
  - Surgical planning is done by the surgeon within the program
- Surgical planning is quick, and there are many judgment calls made in the process
  - Surgical Planning cannot be delegated
  - Surgeon review of plans created by others violates the End User License Agreement
Surgical Planning

• The DataLink Alcon Edition software organizes treatments according to treatment profiles

• DataLink automatically assigns nomograms to each treatment profile
  – Nomograms are used to calculate a suggested laser adjustment for each treatment

• Nomograms are updated daily and become more specific for each surgeon as data are added
Treatment profiles

- Describe the attributes of the procedure
  - Surgeon
  - Laser
  - Treatment Range
  - Keratome (if used)
  - Optical Zone
  - Etc.

- Treatment profiles are provided during the program setup based on the information provided for each surgeon

- Additional profiles can be added as needed
Surgical Planning

- Plans are based on the preoperative information entered
- 3 steps are involved
  1. Enter the target for sphere and cylinder
  2. Select a treatment profile
  3. Review the output
Once a preop exam has been saved for an eye, the program provides an option to enter a surgical plan.
The program displays the preoperative refraction at the top of the Surgical Planning section.
Enter the desired Target for sphere and cylinder:

- The Target is the desired Postop refraction

- E.g., a sphere of -1.50 might be entered for a monovision case
For most eyes, leave the “Age Adjust” button clicked.

Generally, unclick this for:

- Monovision
- Young patients with intense near activities, such as a dentist
- Older patients with intense distance needs, such as pilots

Age adjustments may be used in one eye, only.
Age adjustments

• Age adjustments compensate for the patient’s expected tolerance to postoperative refractive errors
  – Age (in general) does NOT affect the laser ablation characteristics, but it does affect the patient’s tolerance to hyperopia or myopia

• Unless the patient has specific needs (such as pilots, accountants, dentists, etc.) most surgeons prefer to use the age adjustment option
Age adjustments

- In general, DataLink provides age adjustments to prevent hyperopia in older patients and myopia in younger patients.

- Adjustments vary with each treatment and are performed according to:
  - The patient’s age
  - The range of treatment (smaller treatments require less adjustment)
  - The accuracy of prior results
  - (more accurate results permit smaller adjustments)
Surgical Planning
Select the treatment profile to be used for this procedure.
Select the treatment profile

- Select the treatment profile to be used for this procedure
  - If the appropriate treatment profile is not present, you can add a new one by clicking the “Add” Button
  - Before you add a profile, check to be sure the preoperative refraction is accurate! treatment profiles are loaded according to the current treatment range and incorrect data can prevent the profile from loading

- Each treatment profile is associated with nomograms for both sphere and cylinder
  - If adequate data have been entered, the nomograms are surgeon-specific based on your own results
  - If not, the nomogram is taken from a “Library” of validated nomograms that represent the average for this procedure and laser
Surgical Planning

Click Next to continue
The suggested programmed amount is provided in the yellow section.

The refraction information is provided in the center.

For Treatment Profiles with Surgeon-Specific nomograms, information about the nomogram and likely outcomes is provided at the bottom.
Surgical plan results

Note that the age adjustment is accomplished by altering the sphere target.

These numbers may not seem to “add up” because calculations are performed at the corneal plane – where they do add up – and then re-vertexed back to the spectacle plane.
Surgical plan results

WaveLight Lasers in the US require treatments to be rounded to 0.25 D increments
Click the words “Surgeon Selected” to round the data

<table>
<thead>
<tr>
<th>Suggested Software Input Data</th>
<th>Sph</th>
<th>Cyl</th>
<th>Axis</th>
<th>Vertex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested</td>
<td>-3.22</td>
<td>-0.21</td>
<td>175</td>
<td>12.50</td>
</tr>
</tbody>
</table>

**Surgeon Selected**

<table>
<thead>
<tr>
<th>Status</th>
<th>Surgeon</th>
<th>Surgeon</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>1112746</td>
<td>1112747</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nomogram Statistics</th>
<th>Sph</th>
<th>Cyl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Eyes</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>First Surgery</td>
<td>7/12/2006</td>
<td>7/12/2006</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nomogram Prior Results</th>
<th>Sph</th>
<th>Cyl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local OD (D)</td>
<td>0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>2D Range</td>
<td>-0.16 to +0.00</td>
<td>-0.01 to +0.01</td>
</tr>
<tr>
<td>95% Range</td>
<td>-0.24 to +0.08</td>
<td>-0.02 to +0.02</td>
</tr>
</tbody>
</table>
Surgical plan results

Click the links “Use Suggested” and “Round to 0.25 D” to round the data

This avoids having to retype the data and reduces opportunities for human error
• You may modify the rounded amounts as needed
• Rounding may not follow the math, but may occur with clinical considerations in mind
• Tips for Rounding:
  – Use “math rounding” for small differences, e.g., < 0.05 D
  – Sphere: Round to increase rather than negate the age adjustments
  – Round down to avoid flipping the cylinder axis
Using the Suggested Programmed Amount

- Validate all the data to ensure accuracy

- Important: Enter data into laser so that the Suggested Programmed Amount is the amount treated
  - Enter the **Suggested Programmed Amount** as the refraction
  - Do NOT re-enter target offsets for monovision as they have already been incorporated into the treatment
  - The target entered into the laser should always be plano for eyes planned using SurgiVision® DataLink Alcon Edition
Statistics appear in the bottom section for plans using Surgeon-Specific nomograms. This information can be very helpful in strategizing the targeted outcome. It is based on your own data for similar procedures and can be very predictive.
Surgical plan results

The range of expected outcomes may prompt adjustments in the targeted outcome.

→ Click Edit This Plan to make any changes.

These statistics are only provided for treatment profiles with surgeon-specific nomograms.

→ NOT for Library nomograms.
• Plan both eyes prior to printing
• Click “Open Surgical Plan” to print the plan results
• Plans must be printed and signed by the surgeon prior to use as a condition of the End User License Agreement
Process plans for both eyes before printing, to allow both plans to appear on one page.

Note that the surgeon must sign the plan prior to use.
Specific treatments can be kept out of the nomogram calculation, if desired.

Do this when entering the treatment for the eye.

Click “Exclude Eye from Nomogram”

→ This is usually checked if the eye experienced issues during surgery.
Nomograms

- The software automatically assigns nomograms to each Treatment Profile
  - Profiles start with library nomograms based on average outcomes for the profile
  - “Best-Fit” nomograms are provided as data are entered
  - Surgeon-specific nomograms are provided when enough data are available for the Treatment Profile
- Nomograms are calculated on a daily basis and preferentially use the most recent treatments
- Treatments performed over one year ago do not participate in the nomogram
Nomogram Trends

• Every Treatment Profile has specific nomograms for sphere and cylinder adjustments
• Nomogram adjustments tend to be similar for all the profiles, but the magnitude will vary
  – Understanding the trends allows you to validate the suggested programmed amounts
• The following slides summarize the nomogram trends seen with the WaveLight lasers
  – Note that significant variations may be seen from system to system
Nomogram Trends

- **Hyperopic** nomogram adjustments tend to be relatively small
  - Expect increase in suggested treatment for low hyperopia
  - Expect mild reductions in cylinder programmed amounts
- **Myopic** nomograms tend to recommend larger adjustments
  - Expect increase in suggested treatments for low myopia, decrease in higher amounts
    - Small or no adjustments at about -4 D
  - Expect significant decrease in suggested cylinder programmed amounts
    - The effect is non-linear
    - Higher cylinder treatments require proportionately greater reductions to avoid flipping cylinder axes
Nomogram Trends – Coupling

• There are significant “coupling” effects with this laser for myopic treatments with myopia
  – Much less so in hyperopia
• Sphere tends to increase cylinder treatment results
  – Suggested reductions in cylinder programmed amounts increase with higher concurrent sphere treatments
• Cylinder treatments tend to cause a MYOPIC shift
  – This is the opposite of most other lasers, in which myopic cylinder treatments add to the sphere effect
  – This may make you nervous at first
• Understanding these issues permits you to “validate” the suggested programmed amounts against your expectations!
Nomogram Trends – Cylinder Coupling

- Cylinder treatments with this laser use a “PTK” ablation in one meridian and a myopic treatment in the other meridian
  - This is different than most other lasers, which just use an ellipsoid or oval shape to treat cylinder
- The PTK ablation with this laser tends to have a hyperopic ablation pattern to it
  - This results in the induction of myopia with cylinder treatments
- This explains the “reverse coupling” seen with cylinder treatments

Ablation profile of a pure myopic cylinder treatment. Note the “PTK” ablation in the horizontal meridian. This ablation tends to induce a myopic shift, requiring the nomogram to compensate by adding to the myopic sphere treatment to prevent residual myopia.
Nomogram Trends - Mixed Astigmatism

• All mixed astigmatism treatments with WaveLight lasers are performed using a myopic treatment for sphere with a hyperopic cylinder ablation
  – This occurs regardless of the cylinder notation (plus or minus) programmed into the laser
• Mixed astigmatism adjustments tend to be more like hyperopic treatments than myopic treatments
  – I.e., the adjustments are smaller in magnitude than with myopia and the coupling issues are less pronounced
Surgical planning: Key concepts

- Treatment profiles describe the attributes of the treatment such as surgeon, laser and treatment elements

- The target is the desired refractive goal of the treatment
  - Think of the target as a range, not a number

- Age adjustments modify the target range to cause the outcomes to be more likely to be tolerated

- Prior results can be used to estimate likely outcomes for the upcoming case
  - Use info to adjust the target, if necessary
Surgical planning: Key concepts

- The person using the software to make surgical plans must be the surgeon

- Surgical Plans MUST be printed and signed to be valid!
  - Surgeon assumes all liability for use, per the End User License Agreement (EULA) of the software
Clinical Pearl: Avoid PRK for Hyperopia

- Data show PRK is less predictable than LASIK for hyperopia
  - PRK is relatively contraindicated for hyperopic treatments
  - Except when specifically indicated, such as after RK
- This is not unique to WaveLight lasers, but applies to all excimer lasers
  - Reasons extend from the peripheral nature of the treatment and corneal curvature leading to a reduction in laser fluence
  - The higher ablation threshold of Bowman’s amplifies the impact of this effect
  - Cylinder treatments are particularly vulnerable to this issue
- WaveLight lasers overcome this with LASIK by using a higher fluence than most other platforms
  - This still isn’t enough to overcome the issues completely
- Use LASIK whenever possible for hyperopic treatments
LASIK for Hyperopia works well with this laser

- Long term data show excellent refractive stability with the WaveLight lasers using LASIK
  - Keratometry stable through 4 Diopters of treatment

Knowledge Assessment

You must answer each question correctly and understand all issues before using SurgiVision DataLink Alcon Edition software!
Question 1

• Due to the software automation, surgical planning can be safely delegated to technicians
  – True
  – False
Question 1

• Due to the software automation, surgical planning can be safely delegated to technicians
  – True
  – False

False! Surgical planning contains many subtleties and the surgeon must take an active role. All plans must be printed, then reviewed and signed by the surgeon.
Reviewing printed plans created by other personnel is not acceptable.
Question 2

- Treatment profiles describe the treatment attributes such as the surgeon, laser, procedure, optical zone and keratome. They are used to associate similar procedures in the software.
  - True
  - False
Question 2

• Treatment profiles describe the treatment attributes such as the surgeon, laser, procedure, optical zone and keratome. They are used to associate similar procedures in the software.
  – True
  – False

True! Treatment profiles are central to the organization of information in DataLink.
Question 3

• The surgeon must select a nomogram to use with each treatment profile.
  – True
  – False
Question 3

• The surgeon must select a nomogram to use with each treatment profile.
  – True
  – False

False! One of the key features of DataLink is the automatic creation and association of nomograms with each treatment profile. This process occurs daily based on the most recent information entered. For this reason, ongoing postoperative data entry is needed to keep nomograms current.
Question 4

- Age adjustments should only be used in patients with presbyopia.
  - True
  - False
Question 4

- Age adjustments should only be used in patients with presbyopia.
  - True
  - False

False! Age adjustments are helpful for all patients to avoid over or undercorrection. They are based on age and the accuracy of prior treatments in the current range. Surgeons should not use adjustments for special cases.
Question 5

• The target refraction is the ideal outcome. The expected outcome is actually some range around the target.
  – True
  – False
Question 5

• The target refraction is the ideal outcome. The expected outcome is actually some range around the target.
  – True
  – False

True! All treatments are subject to some sources of error. The actual range of expected outcomes for each treatment can be calculated from prior results and is displayed in the surgical plan report.
Question 6

- I must enter at least 40 eyes to begin using DataLink for surgical planning.
  - True
  - False
Question 6

- I must enter at least 40 eyes to begin using DataLink for surgical planning.
  - True
  - False

False! DataLink provides nomograms from a library of validated nomograms from the very first case. Once you have entered 40 eyes with postop exams for a Treatment Profile, DataLink will calculate a surgeon-specific nomogram and automatically assign it to the profile.
Question 7

• Once my profiles have a nomogram I can stop entering postoperative data.
  – True
  – False
Question 7

• Once my profiles have a nomogram I can stop entering postoperative data.
  – True
  – False

False! Nomograms change over time with seasons, aging laser optics and other factors. At least one accurate postoperative refraction should be entered for each eye to keep the nomograms current.
Question 8

• Most surgeons enter the 1 month exam for myopic LASIK and 3 month exam for hyperopia and PRK into DataLink, to be used for the “nomogram” refraction.
  – True
  – False
Question 8

• Most surgeons enter the 1 month exam for myopic LASIK and 3 month exam for hyperopia and PRK into DataLink, to be used for the “nomogram” refraction.
  – True
  – False

True! These exams are adequate for most eyes. If you enter later data the program will use the last postoperative exam for nomogram purposes.
Question 9

• The statistics and math behind DataLink nomograms are always going to be more accurate than my surgical judgment.
  – True
  – False
Question 9

- The statistics and math behind DataLink nomograms are always going to be more accurate than my surgical judgment.
  - True
  - False

False! DataLink bases recommendations on the data that has been entered. Your experience includes many other factors. Always trust your own instincts over the program’s recommendations!
Question 10

- I acknowledge that I am the operating surgeon, that I am comfortable with the material presented here and that all use of DataLink will be under my direct supervision as specified under the Terms and Conditions of Use.
  - True
  - False
Question 10

• I acknowledge that I am the operating surgeon, that I am comfortable with the material presented here and that all use of DataLink will be under my direct supervision as specified under the Terms and Conditions of Use.
  – True
  – False

True! If you have any questions, please contact us directly: Support@SurgiVision.net
Questions?

- DataLink Forum (to ask a question of your colleagues)
  NOTE: Must be sent from surgeon’s email address
  DataLinkAlconForum@surgivision.net

- Contact for clinical and technical questions or comments:

  General Software Questions: Support@SurgiVision.net
  +1-480-664-1800 (GMT – 7)

  Surgery Related Questions: Surgeons should contact Dr. Kezirian directly at Guy1000@SurgiVision.net
Thank You!