

Software User's Guide
Software Version 1.1

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Orthofix wishes to thank the following surgeons for their contribution to the development of this User's Guide:

Franz Birkholtz, M.D.

Alexander Cherkashin, M.D.

Mikhail Samchukov, M.D.

William Terrell, M.D.

TL-HEX Software User's Guide: Software version 1.1

The applicable End User License Agreement can be found at <http://tlhex.com/policies/Eulapolicy.html>

The applicable privacy policy can be found at <http://tlhex.com/policies/privacypolicy.html>

Security Precautions:

User is advised to clear the browser history (temporary Internet files, cookies, etc.) after logging out of the TL-HEX application.

Computer System Requirements

Display Settings:

Screen resolution of 1024 x 768 Pixel or higher.

Supported Browsers:

Microsoft Internet Explorer®: Version 8 or 9

Microsoft and Internet Explorer are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries

Internet Connection:

High-speed Internet connectivity is recommended.

Language Setting:

Select the "Language" setting in the Internet Explorer browser for the country of origin. This will provide the correct date setting.

My Username: _____

My Password: _____

My Email Address: _____

1. Introduction

The TL-HEX is a circular external fixator based on Ilizarov principles. The working segment of this frame consists of a hexapod made up of two rings (circular external supports) and six variable-length struts (Fig. 1). The relative strut lengths determine the position of the rings in space. Because the rings are attached to bone segments, their position indirectly determines the position of the bone segments.

The SW is able to calculate strut length adjustments for surgeon's review and approval.

The software needs three sets of parameters to calculate correction. These are:

- 1) deformity parameters
- 2) frame parameters
- 3) mounting parameters

The deformity parameters define to the software what the deformity or fracture displacement looks like. The second set of parameters describes the size and shape of the frame that is used. The third set of parameters designates where the frame's reference point is in relation to the fracture or deformity area. With these sets of parameters the software will be able to calculate, for surgeon review and approval, appropriate strut adjustment for the patient to achieve the treatment goals.

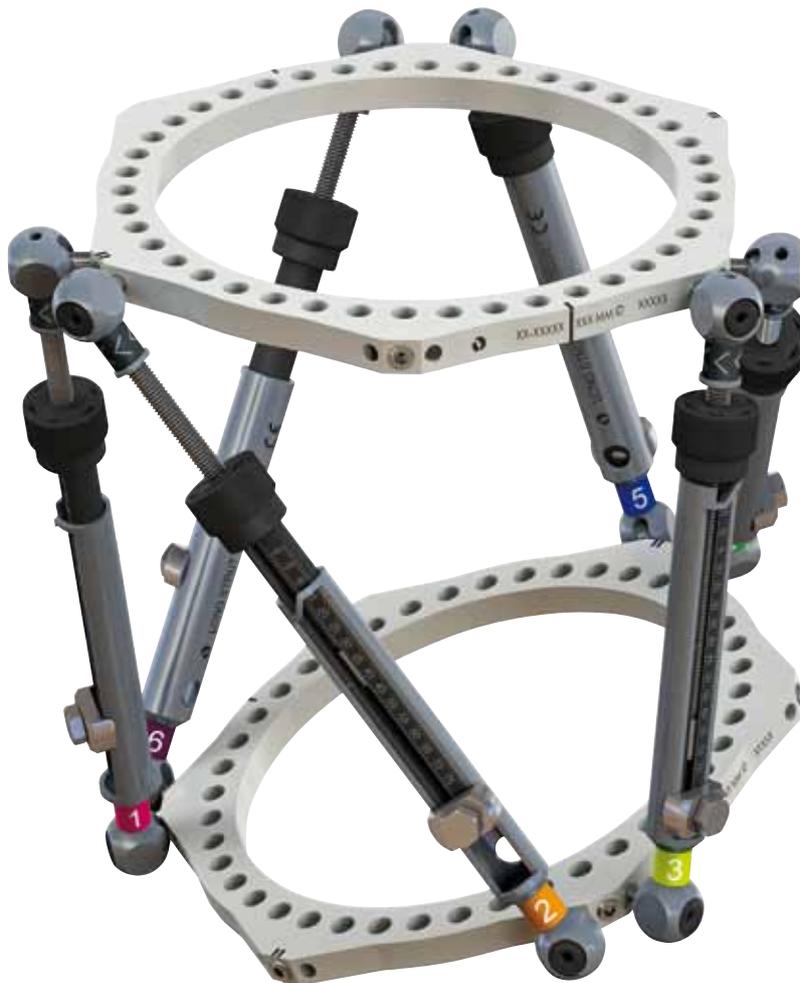


Fig.1 TL-HEX circular external fixator consists of two rings and six variable-length struts.

2. Nomenclature

In the description of the fracture or deformity, one of the bone segments is defined as the **reference segment** and the other one as the **moving segment**. In the software diagrams, the **reference segment** is indicated as a **blue** segment, and the **moving (non-reference)** segment as **green**. The surgeon chooses a reference segment, either proximal or distal. Choosing proximal referencing means that the frame and the deformity are orientated relative to the axis of the proximal segment. The deformity parameters (what the bone looks like) should be described accordingly. Therefore, the translation of the distal segment is described in relation to the proximal segment. If the distal segment is chosen as the reference segment, the frame and the deformity are orientated relative to the axis of the distal segment and measurements would need to be taken in relation to this orientation. For example, medial translation of the distal bone segment would be described as lateral translation because the proximal segment would be translating laterally in relation to the distal (reference) segment (Fig. 2).

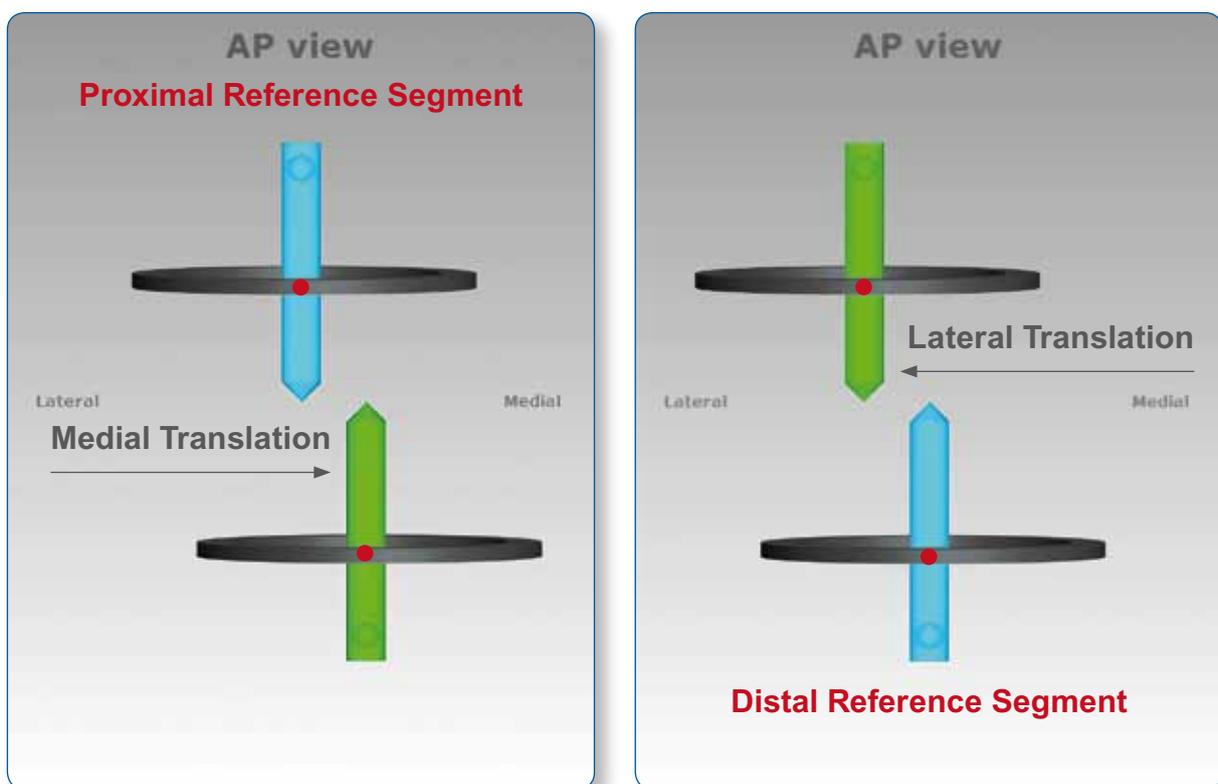


Fig. 2. Description of moving bone segment translation depending on proximal or distal location of the reference segment.

It is important to realize that changing from proximal to distal referencing will change direction of translation in both AP and ML views, but will not change length or angulation parameters because these are mathematically independent of the point of reference.

To minimize measurement errors on the x-rays, the shortest segment should be used as a reference segment. For example, if a correction was performed around a proximal tibial osteotomy or fracture, the proximal segment should be used for referencing. If surgeon is dealing with a distal femoral fracture or deformity, the distal segment should be used as the reference segment.

There are three diagrams in the software. The first diagram is the **AP view** diagram corresponding to the standard AP x-ray of the limb. The second diagram is the **ML view** diagram representing the standard ML x-ray of the limb. There are orientation keys on these two diagrams that indicate the medial/lateral and anterior/posterior aspects, respectively. The third diagram is the **Axial view** diagram representing the view we would have when looking either up or down the limb from the reference segment. On this diagram, the orientation keys are anterior, posterior, medial, and lateral (Fig. 3).

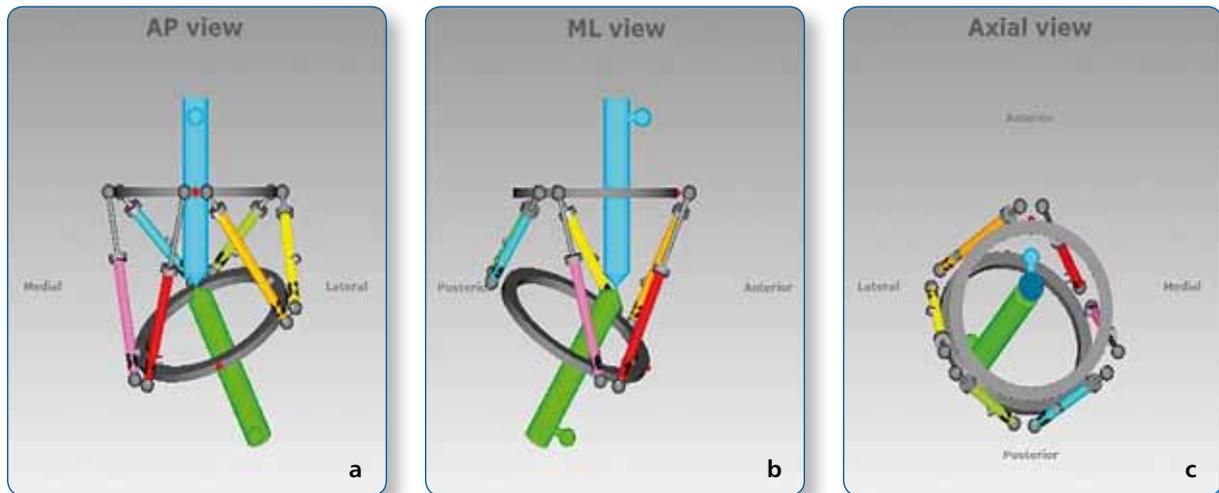


Fig. 3. Standard AP view (a), ML view (b) and Axial view (c) software diagrams. The proximal (reference) segment is indicated in blue and the distal (moving) segment in green. There is valgus-procurvatum deformity of the limb as evidenced by the direction of angulation on the AP view. The frame is comprised of two rings interconnected by 6 struts. In all three diagrams, the master and antimaster tabs are marked with red dots.

The struts are attached to full rings or 5/8 rings in pairs using special angulated tabs around the circumference of the external support. Each full ring has 3 working tabs, which will have struts attached to them and three non-working tabs. Each 5/8 ring has 3 working and 2 non-working tabs. For proper identification, the struts are numbered using color number clips. The clips are numbered from 1 to 6 and color coded as red (1), orange (2), yellow (3), green (4), blue (5), and purple (6).

The struts are numbered by the surgeon, according to the following rules:

- On the proximal external support, struts 1&2, 3&4, and 5&6 will be strut pairs that run on the three common working tabs
- On the distal external support, struts 2&3, 4&5, and 6&1 will converge onto the common working tabs
- The tab from which strut 1 and 2 originate is hence always on the proximal ring and is known as the **master tab**
- The master tab is important to determine the way that the frame is rotated around the limb when referencing proximally
- The tab on the distal ring that is situated opposite to the master tab (i.e., the one in the base of the triangle formed by struts 1 and 2) is called the antimaster tab
- The antimaster tab is important to determine the way that the frame is rotated around the limb when referencing distally
- The master tab is always on the proximal ring and the antimaster tab is always on the distal ring, regardless of which segment is chosen as the reference segment

The software will create a *prescription*, for surgeon review and approval, indicating direction and daily amount of adjustment for each strut. TL-HEX struts (Fig. 4) consist of two telescoping aluminum tubes, an outer tube (A) and an inner tube (B), which can be locked together at various lengths using the side locking bolt (C) and clamp washer (D). The inner tube is attached to a spring-loaded, black knurled adjustment knob (E). The adjustment knob mates with the threaded rod (F) in a manner such that the rod translates relative to the inner tube when the knob is rotated. This will provide gradual changes of overall strut length in 0.5-mm increments. Each strut has two special joints (G,H), one at the base of the outer tube (tube end joint) and the other at the end of the threaded rod (rod end joint). Each joint has a mounting stud (I,J), which can be inserted into the mounting holes on the ring tabs and held in place by the locking screw.

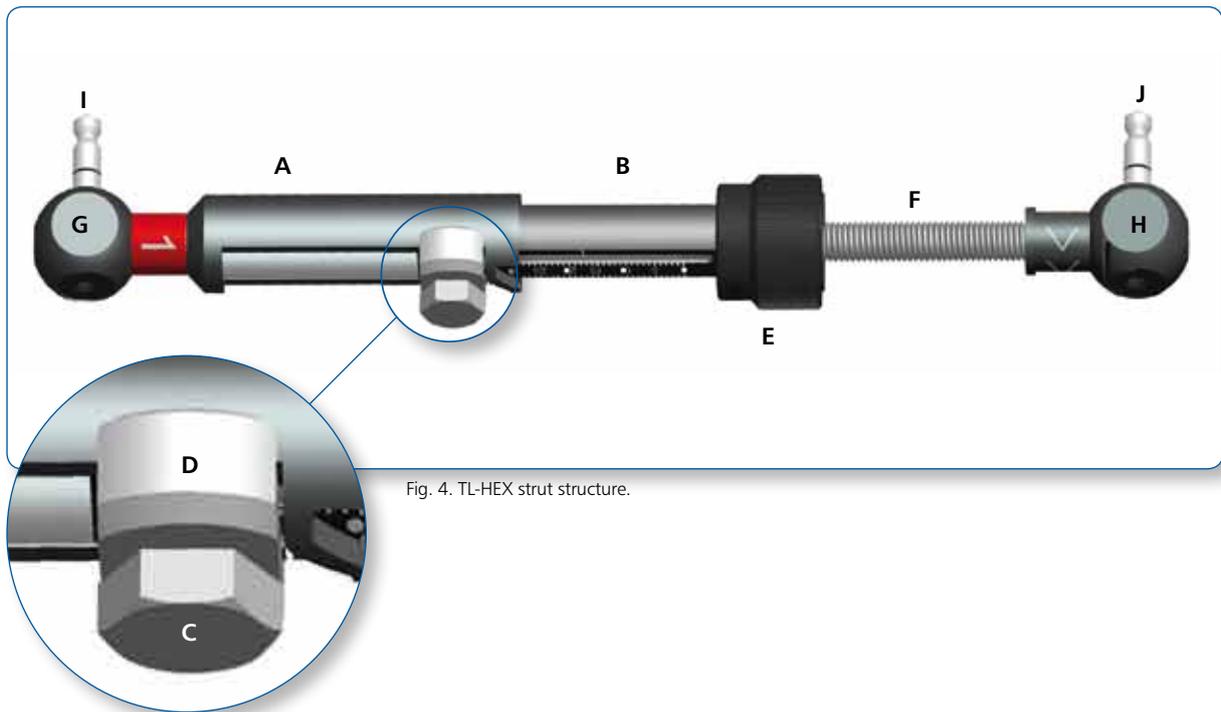


Fig. 4. TL-HEX strut structure.

The TL-HEX struts allow performing *acute and gradual adjustment*. The acute adjustment of the strut length is achieved by untightening the side locking bolt, sliding the inner tube relative to the outer tube to the desired length and re-tightening the locking bolt. Acute adjustment is indicated by the inner tube scale in 1-mm increments relative to the orange-line mark on the outer tube (Fig.5 a). The gradual adjustment is achieved by pulling and rotating the adjustment knob resulting in a noticeable detent (tactile click) every 0.5 mm of adjustment. Gradual adjustment is indicated by the same scale relative to the green-line mark on the end of the threaded rod (Fig.5 b). The direction of adjustment is indicated by the direction clips. The arrow of the direction clips is oriented according to the prescription (see details in General Principles of TL-HEX Frame Assembly, TL-1201-OPT-E0).

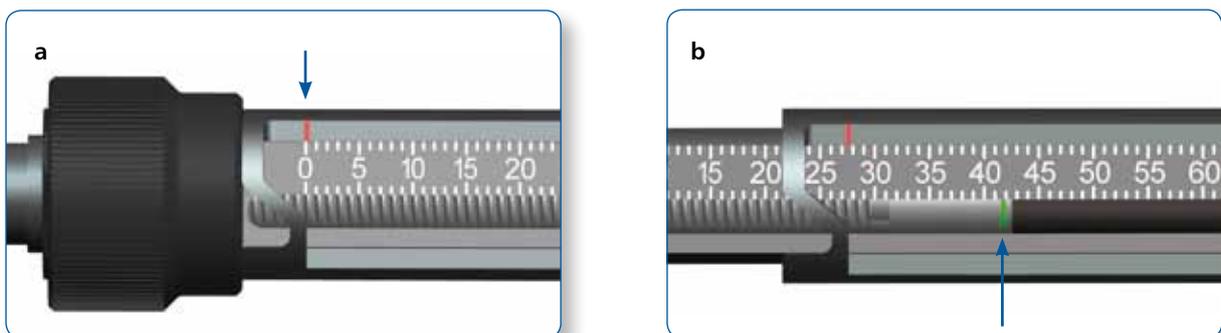


Fig. 5. Indicators for acute (a) and gradual (b) adjustments on the TL-HEX struts.

3. User Access and Account Management

3.1 Obtaining Access

Access to the TL-HEX software is controlled by a Username and Password. The username and password can be obtained at www.tlhex.com by requesting a new account from the [Home Page](#) and following the onscreen instructions. Upon a request being received by Orthofix, it will be validated to confirm whether the applicant has undergone the necessary training to use the system safely and responsibly. Once approved, the surgeon's user account will be activated, and Username and Password will be emailed to the applicant.

3.2 Login Screen

The TL-HEX application is located at: <http://app.tlhex.com>. This location provides the [Login](#) screen (Fig. 6). Enter a valid Username and Password in the appropriate text fields, and click [Sign In](#) to gain access to the software.

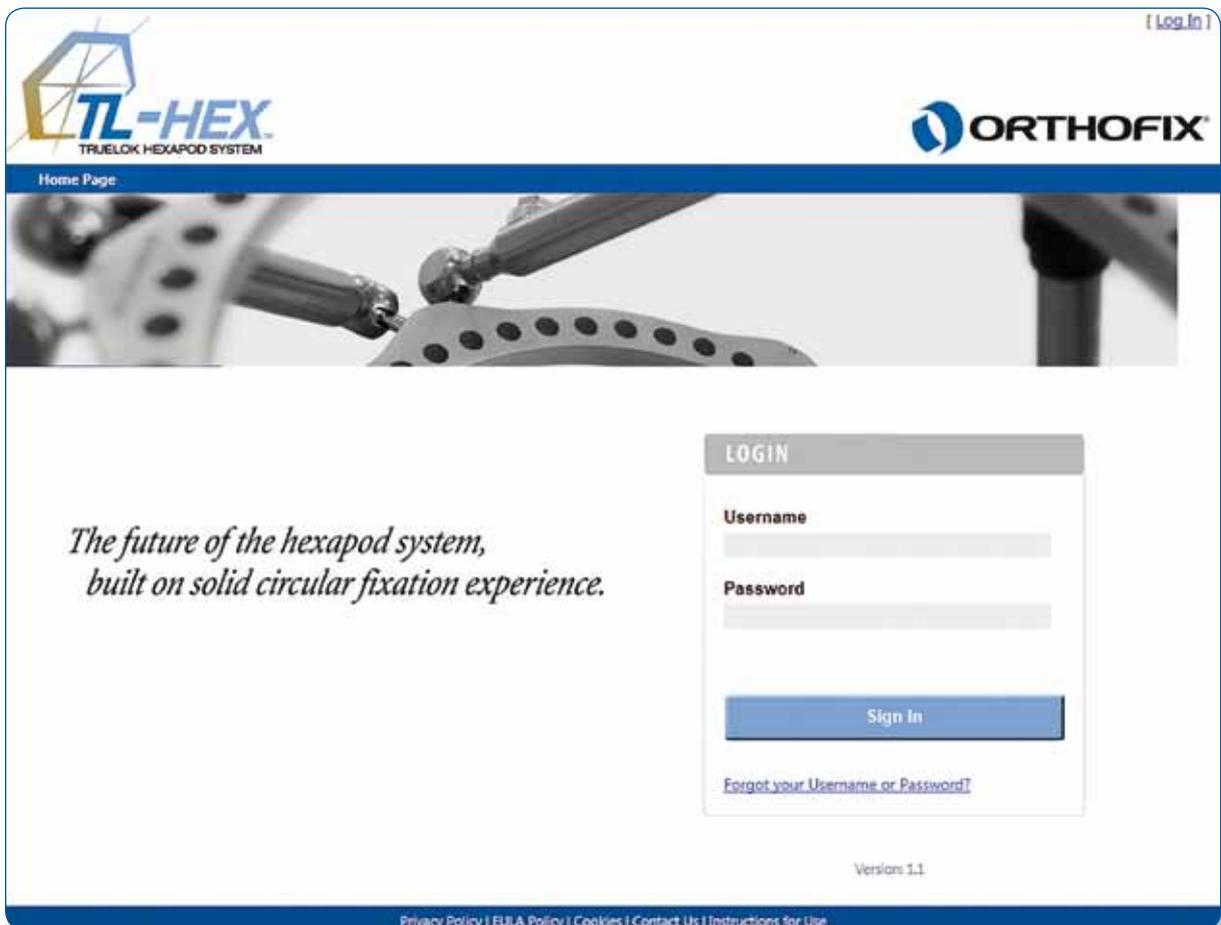
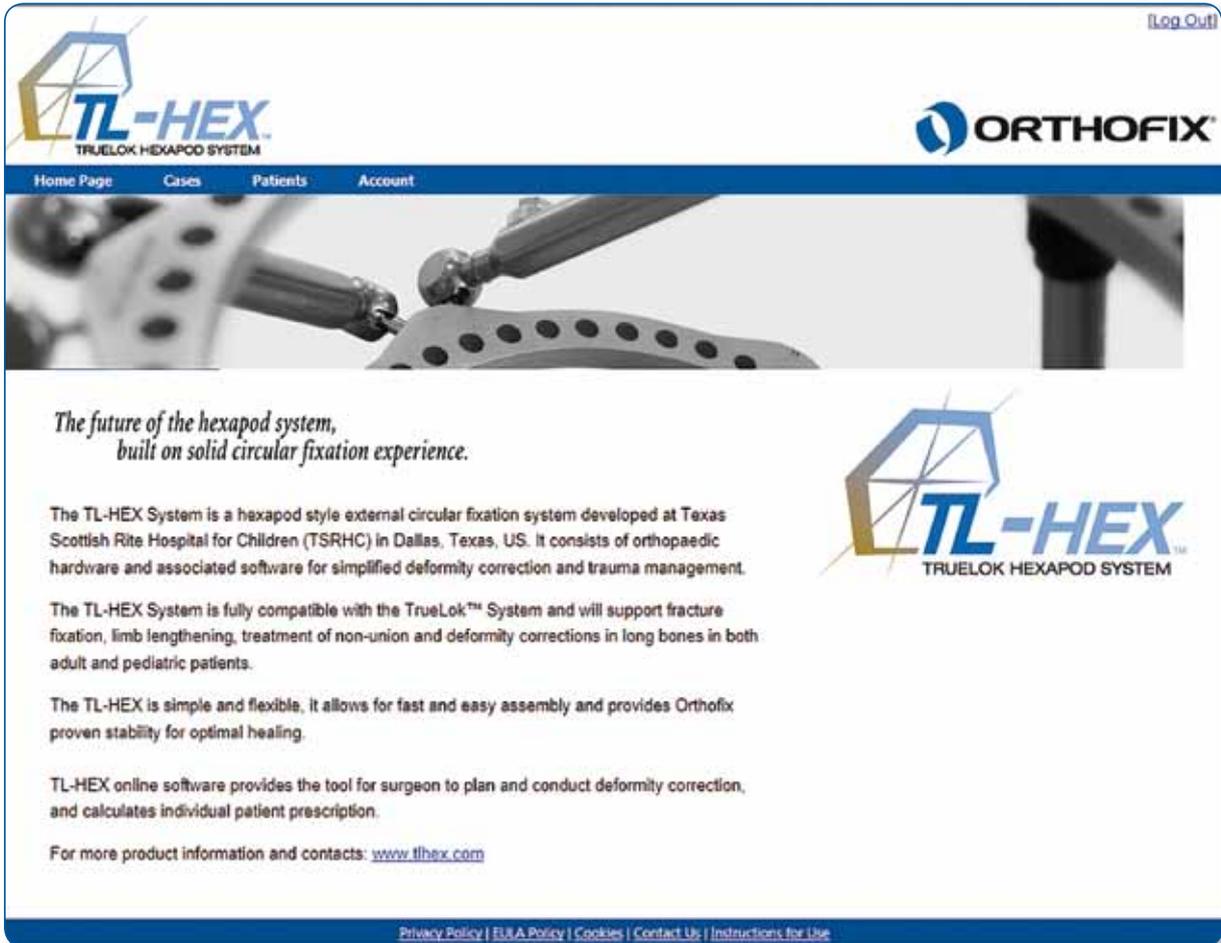


Fig. 6. TL-HEX software Login screen.

3.3 Home Page

After a successful login, the user enters the Home Page of TL-HEX software (Fig. 7).



[Log Out](#)

TL-HEX
TRUELOK HEXAPOD SYSTEM

ORTHOFIX

Home Page Cases Patients Account

*The future of the hexapod system,
built on solid circular fixation experience.*

The TL-HEX System is a hexapod style external circular fixation system developed at Texas Scottish Rite Hospital for Children (TSRHC) in Dallas, Texas, US. It consists of orthopaedic hardware and associated software for simplified deformity correction and trauma management.

The TL-HEX System is fully compatible with the TrueLok™ System and will support fracture fixation, limb lengthening, treatment of non-union and deformity corrections in long bones in both adult and pediatric patients.

The TL-HEX is simple and flexible, it allows for fast and easy assembly and provides Orthofix proven stability for optimal healing.

TL-HEX online software provides the tool for surgeon to plan and conduct deformity correction, and calculates individual patient prescription.

For more product information and contacts: www.tlhex.com

[Privacy Policy](#) | [EUSA Policy](#) | [Cookies](#) | [Contact Us](#) | [Instructions for Use](#)

Fig. 7. TL-HEX software Home Page.

4. Patient and Case Management

4.1 Menu Structure

Patients and Cases menus include a list of patients or cases and allow the surgeon to add a new patient or case, respectively. All cases are related to a patient (Fig. 8). Therefore, a new patient must be created prior to beginning a new case. There are no restrictions on the number of cases that can be associated with each patient.

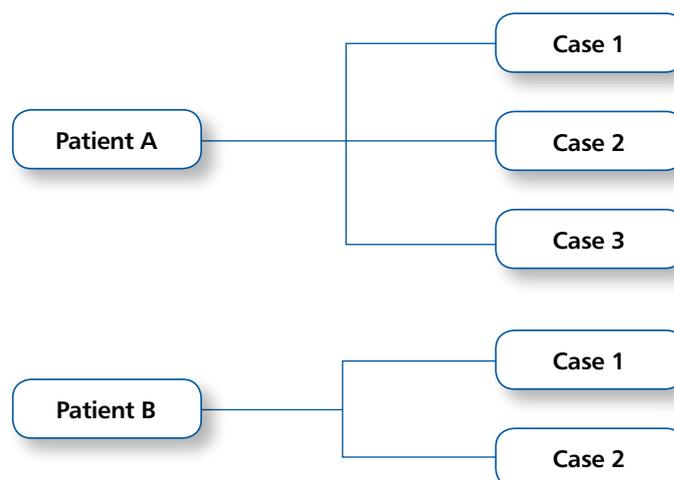


Fig. 8. Patient and Case management menus and structure.

4.2 Add a New Patient

Patients → Add New Patient

All patients are entered into the system through the **Add New Patient** menu. For each new patient (Fig. 9), surgeon should assign a Patient ID, insert Patient Initials (or other reference associated with this patient), select patient Gender, followed by clicking on **Save Patient**. This will open the list of patients, which will include all previously entered patients as well as the newly created patient.

The screenshot displays the 'Add New Patient' interface. At the top left is the 'TL-HEX TRILOK HEXAPOD SYSTEM' logo, and at the top right is the 'ORTHOFIX' logo. A navigation bar below the logos contains 'Home Page', 'Cases', 'Patients', and 'Account'. The main content area is titled 'Add New Patient' and contains three input fields: 'Patient ID' with the value 'Patient A', 'Patient Initials' with the value 'PA', and 'Gender' with radio buttons for 'Male' (selected) and 'Female'. A warning box with a yellow triangle icon is positioned to the right of the input fields, containing the text: 'Warning: You are not allowed to enter or provide any information that allows, directly or indirectly, the identification of your patient (e.g. name, birth date, address, email-address, phone number etc.). Please use only an internal confidential code to identify your patient record when using this Software.' Below the input fields are two buttons: 'Cancel' and 'Save Patient'. At the bottom of the screen, a footer bar contains links for 'Privacy Policy', 'EULA Policy', 'Cookies', 'Contact Us', and 'Instructions for Use'. A 'Log Out' link is visible in the top right corner.

Fig. 9. Add New Patient screen.

Warning: Under the Orthofix Terms of Use (End User License Agreement and Privacy Policy), the surgeon should never enter information that directly identifies a patient. The patient number is intended to be used as an identifying link to the patient within the surgeon's patient management system.

4.3 List of Patients

Patients → List of Patient

User can also view all of the patients by clicking **List of Patients**. This option appears as the cursor hovers over the Patients field of the Navigation menu. From this list (Fig. 10), the surgeon can select a patient, which will lead to the list of cases associated with this patient.

The screenshot shows the 'List of Patients' interface. At the top left is the TL-HEX logo (TRUELOK HEXAPOD SYSTEM) and at the top right is the ORTHOFIX logo. A navigation bar below the logos contains 'Home Page', 'Cases', 'Patients', and 'Account'. In the top right corner, there is a 'Log Out' link. The main content area is titled 'List of Patients' and includes an 'Add New Patient' button. Below this is a table with the following data:

Patient ID	Patient Initials	Gender	Date Created	Edit Patient	Delete
Patient A	PA	Male	29/08/2012		
Patient B	PB	Female	29/08/2012		
Patient C	PC	Male	29/08/2012		

At the bottom of the screen, there is a footer with links: Privacy Policy | EULA Policy | Cookies | Contact Us | Instructions for Use.

Fig. 10. List of Patients screen.

4.4 New Case

Cases → Add New Case

Cases menu includes two options: **List of Cases** and **Add New Case**. A new case can be added by selecting **Add New Case** from the **Cases** menu. Alternatively, surgeon can add a new case by clicking **Add New Case** in the **List of Cases**. Note that all cases must be associated with a patient. When creating a new case, the patient is selected from the drop-down selector to the right of Patient ID. If no patients have been entered, the drop-down selector will be empty.

For each new case (Fig. 11), the surgeon should assign a Case Number and a Case Name (reference associated with this case), select left/right side and the planning date, followed by entering Notes associated with this case (optional).

Proceed to the next step in the treatment planning process by clicking **Next**.

The screenshot shows the 'Add New Case' screen. At the top left is the TL-HEX logo (TRIELOK HEXAPOD SYSTEM) and at the top right is the ORTHOFIX logo. Below the logos is a navigation bar with 'Home Page', 'Cases', 'Patients', and 'Account'. Underneath is a sub-navigation bar with 'Case Data', 'Deformity Parameters', 'Frame Parameters', 'Postoperative', 'End of Correction', 'Schedule', 'Prescription', 'Report', and 'Checkup'. The main form area contains the following fields and elements:

- Patient ID: Patient A (dropdown menu)
- Case Number: 001 (text input)
- Case Name: Case 1 (text input)
- Planning Created: 29/08/2012 (calendar icon)
- Side Selection: Left Right
- New Notes: (text area)
- Notes History (dropdown menu)
- Warning box: **Warning!** You are not allowed to enter or provide any information that allows, directly or indirectly, the identification of your patient (e.g. name, birth date, address, email-address, phone number etc.). Please use only an internal confidential code to identify your patient record when using this Software.
- Next button (bottom center)

At the bottom of the screen, there is a footer with links: Privacy Policy | EULA Policy | Cookies | Contact Us | Instructions for Use.

Fig. 11. Add New Case screen.

Warning: Under the Orthofix Terms of Use (End User License Agreement and Privacy Policy), the surgeon should never enter information that directly identifies a patient. The patient number is intended to be used as an identifying link to the patient within the surgeon's patient management system.

4.5 View Cases

Cases → List of Cases

All cases for all patients in the **List of Cases** are sorted by the Patient ID. The List of Cases can be sorted by clicking on any of the headers (i.e., Patient ID, Case Number, Case Name, Anatomy and Date Created) in the table (Fig. 12).



The screenshot shows the 'List of Cases' interface. At the top left is the TL-HEX logo (TRUELOK HEXAPOD SYSTEM) and at the top right is the ORTHOFIX logo. A navigation bar includes 'Home Page', 'Cases', 'Patients', and 'Account'. A 'Log Out' link is in the top right corner. Below the navigation bar, the title 'List of Cases' is displayed next to an 'Add New Case' button. The main content is a table with the following data:

Patient ID	Case Number	Case Name	Anatomy	Date Created	Delete
Patient A	001	Case 1	Left	29/08/2012	
Patient B	002	Case 2	Left	29/08/2012	
Patient C	003	Case 3	Left	29/08/2012	

At the bottom of the screen, there are links for 'Privacy Policy', 'EULA Policy', 'Cookies', 'Contact Us', and 'Instructions for Use'.

Fig. 12. List of Cases screen.

5. Case Planning

5.1 Case Data

Case data includes case number, case name (reference associated with this case), anatomical site (left or right), and date of planning (see 4.4 New Case for details).

5.2 Deformity Parameters

Once the case information is entered, click **Next** to move to the [Deformity Parameters](#) screen to enter parameters associated with the deformity (Fig. 13).

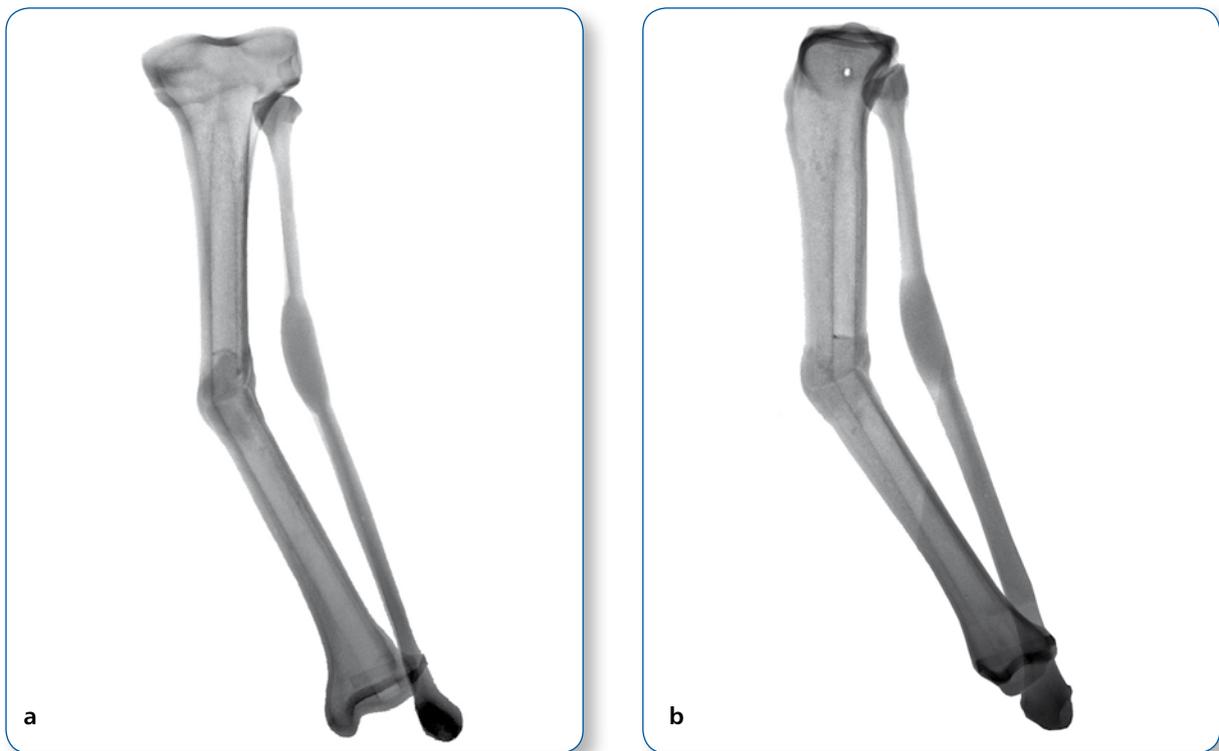


Fig.13. AP view (a) and ML view (b) radiographs of oblique plane midshaft tibial deformity (valgus - procurvatum).

The first step is to choose the reference segment (Fig. 14). The surgeon is free to choose either the *proximal* or *distal segment* as the reference segment depending on the clinical scenario (see 2. Nomenclature for details).

Fig. 14. Default Deformity Parameters screen.

Deformity description includes 3 angulations and 3 translations (Fig. 14). The three angulations are coronal plane angulation in **AP view**, sagittal plane angulation in **ML view** and horizontal plane angulation (rotation) in **Axial view**. *Coronal plane angulation* can be either varus or valgus, depending whether the distal segment is bent towards or away from the midline, respectively. *Sagittal plane angulation* will be described as either apex anterior (procurvatum) or apex posterior (recurvatum). *Horizontal plane angulation* can be described as internal or external rotation. With internal rotation, for example, the distal segment is rotated along its longitudinal axis towards the midline. Because the rotation is difficult to measure radiologically, this parameter will be most commonly established clinically. All angulations are described in degrees. Their direction is independent regardless of whether proximal or distal referencing is chosen.

Similarly, the three possible segment translations are described in the **AP view** (*coronal plane*), **ML view** (*sagittal plane*) and **Axial view**. In the *coronal plane*, the translation can be medial or lateral. Medial translation, for example, means that the moving segment is translated medially relative to the reference segment. In the *sagittal plane*, the translation can be anterior or posterior. Note that these two translations are described in millimeters in relation to the reference segment and direction of translations will change depending on whether proximal or distal referencing is used (see 2. Nomenclature for details).

The third type of translation occurs along the longitudinal axis of the limb. In the software, the *axial translation* is described in millimeters as short or long. The first option (short) is used when the moving bone segment is translated (compressed) towards the reference bone segment. When the moving bone segments is translated (distracted) away from the reference bone segment, the second option (long) is used in description of the axial translation (Fig. 15).

In addition, the *bone length* is included in description of the axial translation. Again, the software provides two options to indicate whether the bone is short or long and enter the relevant amount of bone length discrepancy in millimeters.

Note: The bone length is a clinical parameter indicating limb length discrepancy relative to contralateral limb and will not change bone segment orientation in the software diagrams.

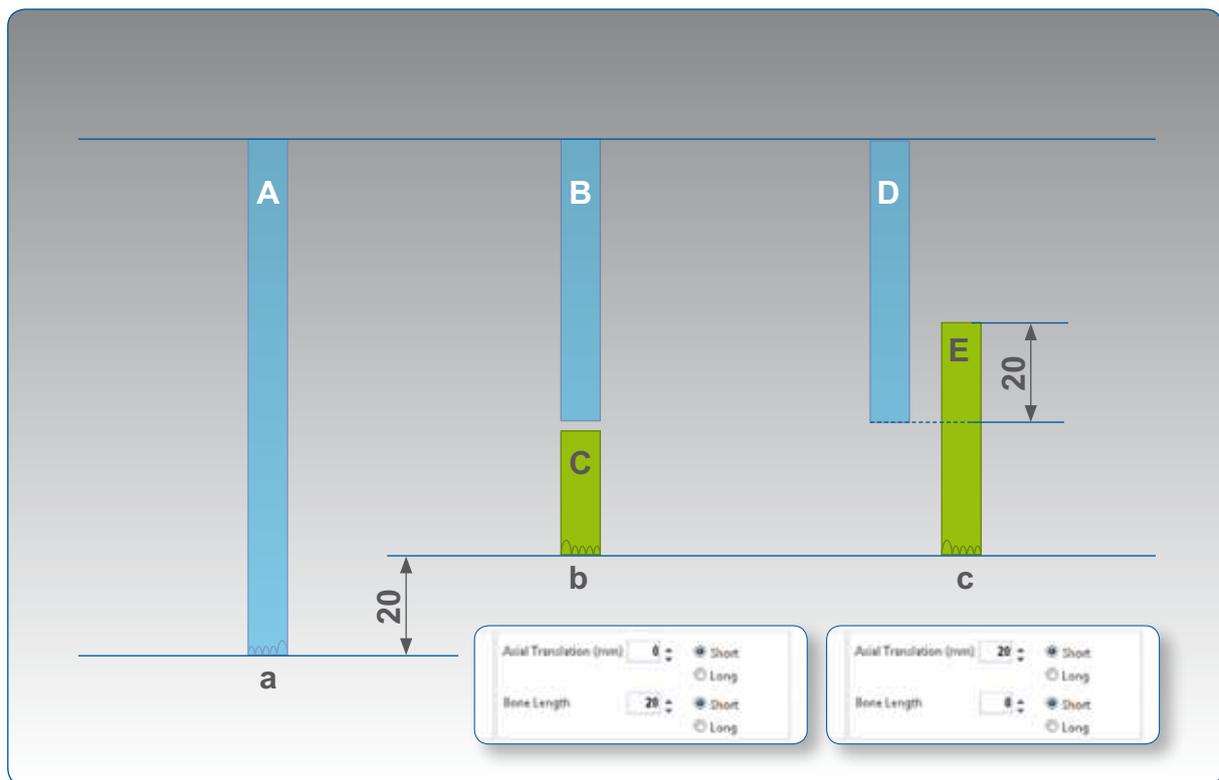


Fig. 15. Description of translation along the longitudinal axis and bone length: (a), contralateral (normal) limb; (b), short limb as result of bone shortening without axial translation; (c), short limb due to axial translation of bone segments. Note that the combined length of bone segments B and C is shorter than the length of contralateral bone segment A. The combined length of segments D and E, however, is equal to the length of contralateral bone segment A.

Click **Update Views** at any time to refresh the display according to the parameters entered (Fig. 16).

The screenshot displays the 'Deformity Parameters' screen in the TL-HEX software. The interface includes a navigation bar with 'Home Page', 'Cases', 'Patients', and 'Account'. Below this is a 'Case Data' section with 'Case Number: 001' and 'Case Name: Case 1'. The 'Deformity Parameters' section contains several input fields and radio buttons for defining deformity parameters. A red arrow points to the 'Update Views' button. Below the button are three 3D bone models labeled 'AP view', 'ML view', and 'Axial view'. At the bottom, there are 'Previous' and 'Next' buttons.

Reference Segment: Proximal Distal

AP Plane Angular Deformity (deg) ML Plane Angular Deformity (deg) Rotation (deg)

Valgus Varus Apex Anterior Apex Posterior External Internal

AP Plane Translation (mm) ML Plane Translation (mm) Axial Translation (mm) Short Long

Medial Lateral Anterior Posterior Bone Length (mm) Short Long

Update Views

AP view ML view Axial view

Previous Next

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Fig. 16. Updated Deformity Parameters screen.

Note: It is an important safety mechanism to check whether the diagrams on the software correspond to the deformity that is seen on the patient's x-rays and/or clinically. Click **Update Views** after any changes or updates to deformity parameters.

Once satisfied with the deformity parameters that have been entered, click either the [Frame Parameters](#) tab or **Next** to proceed to the [Frame Parameters](#) screen.

5.3 Frame Parameters and Mounting Parameters

Frame Parameters screen (Fig. 17) includes two sections: **Select External Supports** and **Mounting Parameters**. Select External Supports section consists of two drop-down menus (ring type and ring size) for each of the proximal and distal external supports. In the example shown, 180 mm full rings have been selected. Should an open external support be chosen (i.e., a 5/8 ring), the relevant ring orientation (open posteriorly, open medially, open anteriorly) should be selected from the drop-down menu. The software will automatically change the orientation offset of the 5/8 ring in the postoperative section.

Note: If choosing two 5/8 rings, the openings cannot be oriented in the same direction (e.g., both open anteriorly, posteriorly, medially). Software also does not allow 5/8 ring placement open laterally. Surgeon can adjust orientation of 5/8 rings later in the **Postoperative** screen, placing their openings in desired orientation by entering rotation of the reference ring and postoperative struts lengths.

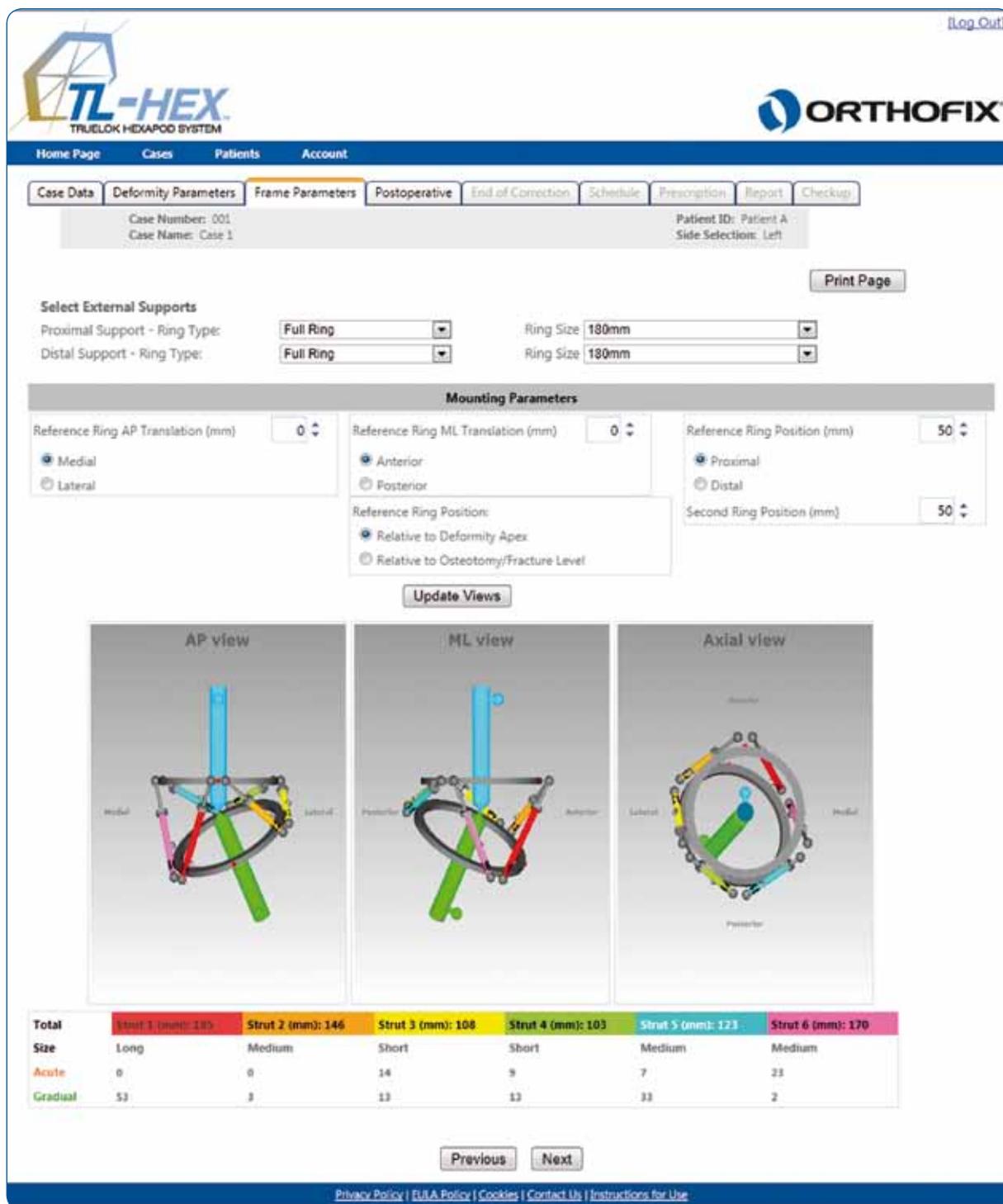


Fig. 17. Frame Parameters screen.

Mounting Parameters section appears underneath the external support selection drop-down menus. The default assumption is that both proximal and distal external supports are perpendicular to the corresponding bone segment axis and located at 50 mm distance from the apex of the deformity or the osteotomy/fracture level. The screen provides the capability of adjusting the position of the reference ring in the coronal plane (AP translation), sagittal plane (ML translation) relative to the reference bone segment axis. In addition, the reference and moving ring positions can be adjusted in the axial direction relative to the apex of deformity or the osteotomy/fracture level.

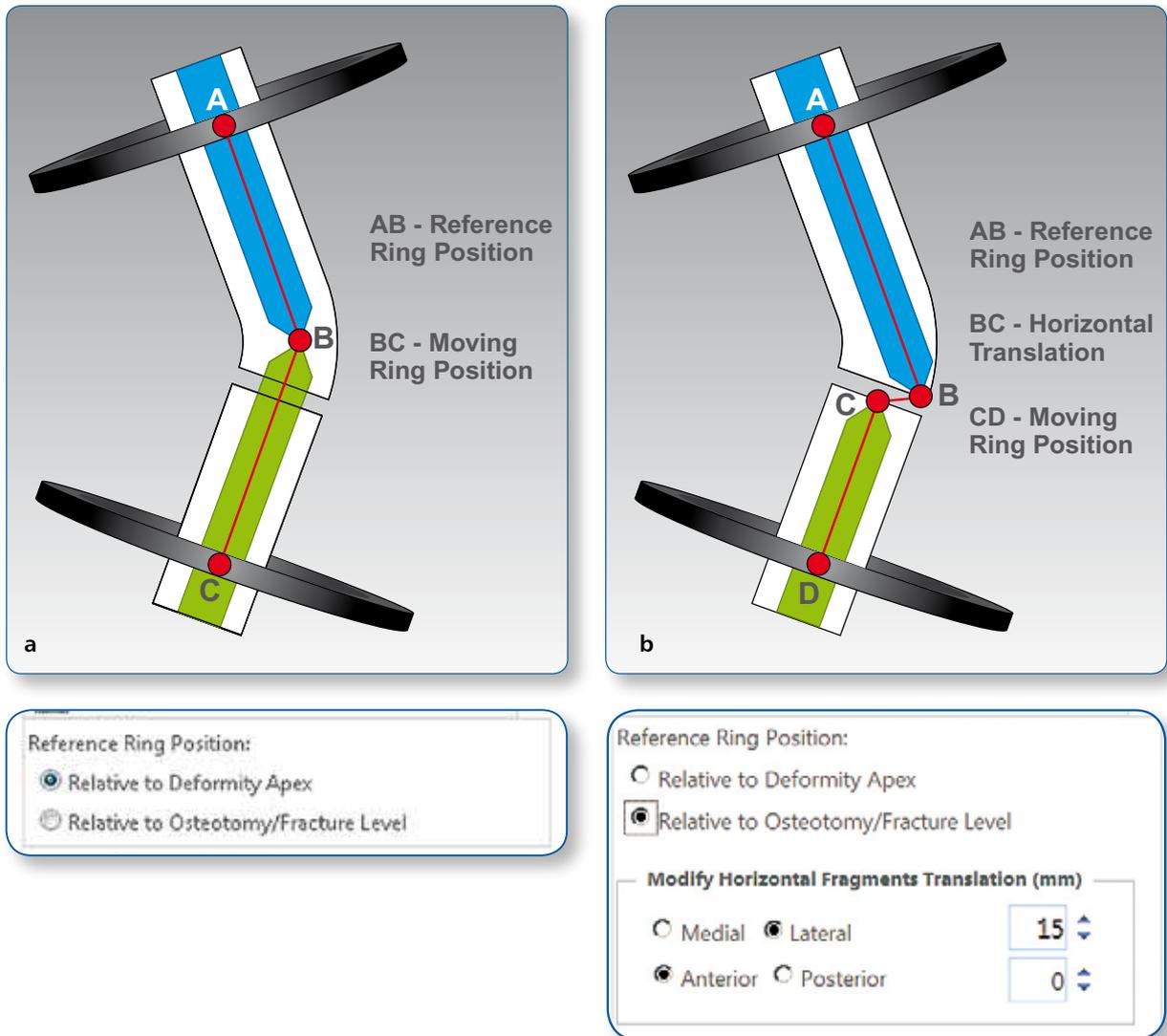


Fig. 18. Description of reference ring position relative to deformity apex (a) or osteotomy/fracture level (b).

The reference ring position in the coronal and the sagittal planes is described in millimeters as the translation (medial/lateral and anterior/posterior, respectively) of the center of the reference ring in relation to the longitudinal axis of the reference bone segment. The reference ring position along the longitudinal axis of the reference bone segment (proximal/distal) is described in millimeters as a distance from the center of the reference ring to the specific point of interest. Similarly, the position of the second ring is described in millimeters as a distance from the same point of interest.

Either the apex of the deformity or the level of the osteotomy/fracture can be chosen as point of interest (Fig. 18). If the AP or ML translation was entered into the deformity parameters section, the osteotomy/fracture level is automatically chosen as point of interest. The surgeon has the ability to adjust previously entered horizontal segment translation depending on the distance between the point of interest and deformity apex.

Although the surgeon can skip entering the mounting parameters, it is suggested that the surgeon complete the Mounting Parameters section. This simplifies the overall data entry and then the application suggests the appropriate strut type and length.

Mounting Parameters section allows preassembly of the frame before surgery to mimic the patient's deformity. Clicking the **Update Views** button after entering the mounting parameters will reveal the preassembled frame construct and render a set of strut lengths that will result in the required frame (Fig. 19).

The screenshot displays the 'Mounting Parameters' section of the TL-HEX software. It includes the following elements:

- Navigation:** Home Page, Cases, Patients, Account. Sub-tabs: Case Data, Deformity Parameters, Frame Parameters, Postoperative, End of Correction, Schedule, Prescription, Report, Checkup.
- Case Information:** Case Number: 001, Case Name: Case 1, Patient ID: Patient A, Side Selection: Left.
- Select External Supports:** Proximal Support - Ring Type: Full Ring, Ring Size: 180mm; Distal Support - Ring Type: Full Ring, Ring Size: 180mm.
- Mounting Parameters:**
 - Reference Ring AP Translation (mm): 0
 - Reference Ring ML Translation (mm): 25
 - Reference Ring Position (mm): 100
 - Reference Ring Position: Medial (selected), Lateral
 - Reference Ring Position: Anterior, Posterior (selected)
 - Reference Ring Position: Relative to Deformity Apex (selected), Relative to Osteotomy/Fracture Level
 - Second Ring Position (mm): 80
- Update Views** button
- 3D Views:** AP view, ML view, Axial view.
- Strut Lengths Table:**

Total	Strut 1 (mm): 234	Strut 2 (mm): 208	Strut 3 (mm): 162	Strut 4 (mm): 149	Strut 5 (mm): 179	Strut 6 (mm): 239
Size	Long	Long	Long	Medium	Long	Long
Acute	18	49	2	33	19	3
Gradual	2	78	78	33	78	2

Fig. 19. Updated Frame Parameters screen.

After clicking "Update Views", check the bottom of the screen for struts that are out of range (indicated by a red number). An out of range strut can be addressed by modifying the mounting parameters of the **Frame Parameters** screen or the surgeon may proceed to **Postoperative** screen.

The complete planning can be output as a PDF file at this point by clicking the **Print Page** button. The summary of the planning can be printed by clicking **Print Frame Parameters**. The hard copy of the planning can be inserted into the patient's chart for the record. It can also be used to request appropriate frame components, as well as, to preassemble the frame. Mounting Parameters portion of frame parameters can be skipped and surgeon can proceed directly to [Postoperative](#) screen.

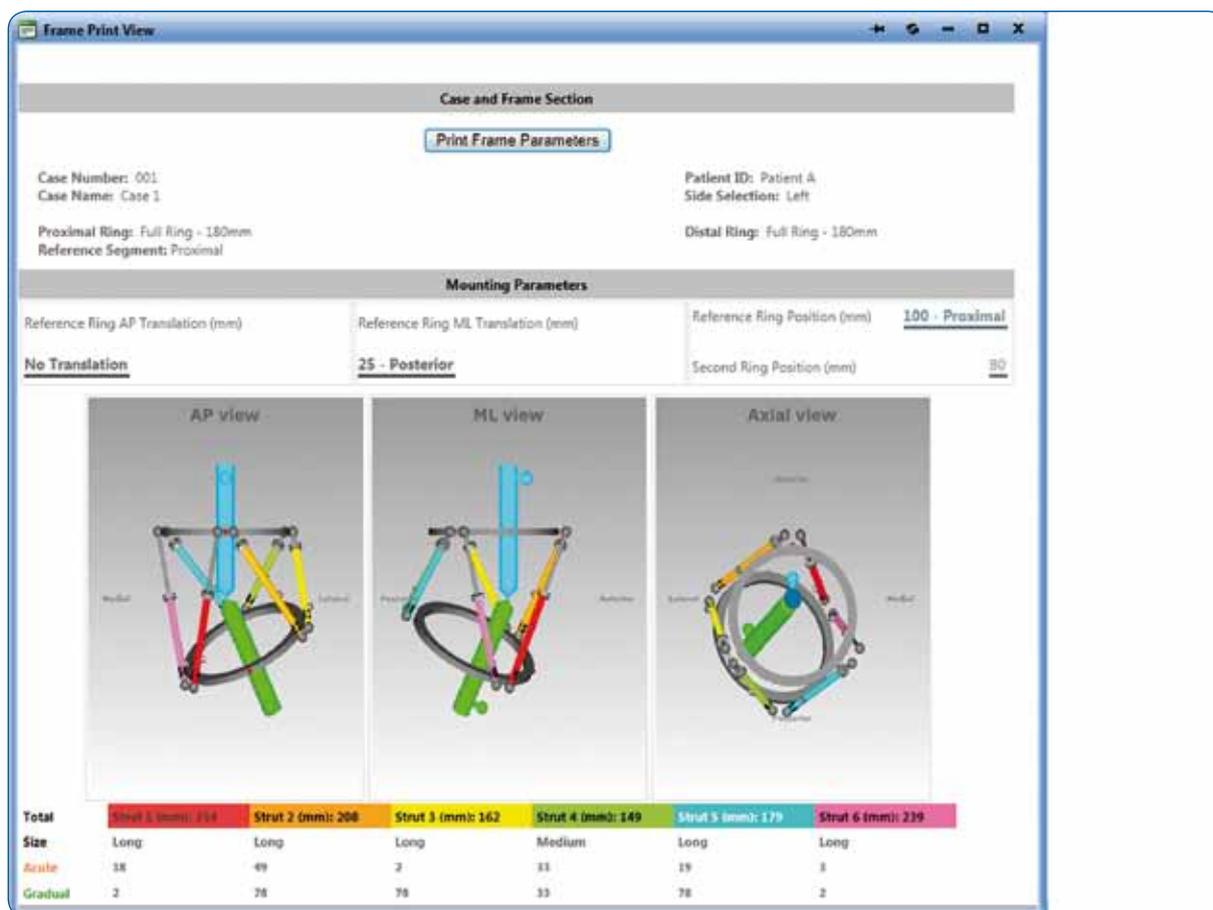


Fig. 20. Frame Parameters Print view screen.

Note: Although the surgeon can skip entering the mounting parameters, it is suggested that the surgeon complete the Mounting Parameters section. This simplifies the overall data entry and then the application suggests the appropriate strut type and length.

5.4 Postoperative Assessment

The Postoperative screen (Fig. 21) provides the ability to enter two sets of parameters (including frame mounting parameters and strut lengths) according to the postoperative position of the rings and struts.

Case Number: 001
Case Name: Case 1
Patient ID: Patient A
Side Selection: Left

Reference Ring AP Translation (mm): 0
 Medial Lateral

Reference Ring AP Angle (deg): 0
 Medial Side Down Medial Side Up

Reference Ring ML Translation (mm): 25
 Anterior Posterior

Reference Ring ML Angle (deg): 0
 Anterior Side Down Anterior Side Up

Reference Ring Position (mm): 100
 Proximal Distal

Reference Ring Position:
 Relative to Deformity Apex
 Relative to Osteotomy/Fracture Level

Frame Rotation (deg): 0
 External Internal

Total	Strut 1 (mm): 254	Strut 2 (mm): 208	Strut 3 (mm): 162	Strut 4 (mm): 149	Strut 5 (mm): 179	Strut 6 (mm): 235
Size	Long	Long	Long	Medium	Long	Long
Acute	18	49	2	33	19	3
Gradual	2	78	78	33	78	2

Fig. 21. Postoperative screen.

In the top portion of the **Postoperative** screen, the position of the reference ring relative to the reference bone segment is entered. Similarly to the **Frame Parameters** screen, reference ring translation in coronal (medial/lateral) and sagittal (anterior/posterior) planes is described in millimeters as translation of the center of the reference ring in relation to the longitudinal axis of the reference bone segment. In the axial plane, translation of the reference ring (proximal/distal) along the longitudinal axis of the reference bone segment is described in millimeters as a distance from the center of the reference ring to specific point of interest (deformity apex or osteotomy/fracture level).

Three (not present in the Mounting Parameters screen section) reference ring angulation parameters are added to the **Postoperative** screen. These parameters reflect angular deviation of the reference ring orientation in the coronal (**AP view**), sagittal (**ML view**) and horizontal (**axial view**) planes from the orthogonal position relative to the reference bone segment. On the AP view, the reference ring angulation is described in degrees as an angle between the projection of the ring and the axis of bone segment with the medial side of the ring either up or down. On the ML view, the reference ring angulation is described in degrees as an angle between the projection of the ring and the axis of bone segment with the anterior side of the ring either up or down. On the axial view, the reference ring angulation (rotation) is described in degrees as external or internal rotation relative to the longitudinal axis of the reference bone segment. If proximal referencing was chosen, the **master tab** will determine the rotational frame offset. If distal referencing was chosen, the **antimaster** tab will determine the rotational frame offset (Fig. 22).

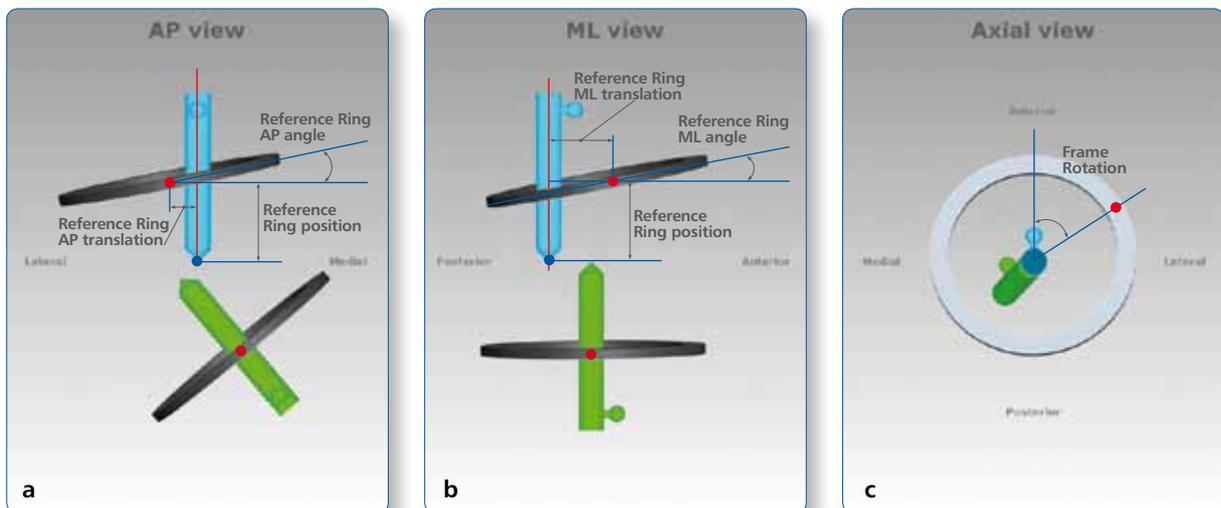


Fig. 22. Reference ring angulation, translation and rotation parameters in AP view (a), ML view (b) and Axial view (c).

At the bottom of the screen (Fig. 21), the strut mounting parameters are entered for all six struts. Parameters for each strut are described in three fields. The first field indicates the strut size (e.g. short, medium, long). The second field is the acute length for the strut in millimeters, which is read off the scale relative to the acute length orange mark. The third field is the gradual length for the strut in millimeters, which is read off the same scale relative to the gradual length green mark. Note that the strut types/lengths in conjunction with the previously entered deformity parameters will define the position of the second (moving) ring relative to the moving bone segment.

If preoperative planning was performed previously, all data (including frame mounting parameters and strut lengths) is transferred automatically to the corresponding fields of the **Postoperative** screen. Surgeon should confirm the data or adjust it if necessary. Strut type (short, medium and long) as well as both acute and gradual adjustment lengths recorded at the end of the surgery should be confirmed or adjusted in the corresponding fields.

These adjustments will describe not only the final shape and orientation of the frame, but also where it is located in relation to the bone segments. Clicking on the **Update Views** at this point will render software generated diagrammatic models that reflect the bone deformity and frame position on the x-rays. In case of discrepancy, the surgeon should go back and check all the variables before proceeding to the next step.

If changes are made in the **Postoperative** screen followed by changes to deformity parameters, frame parameters section should be skipped over assuming that the frame is already placed on the patient and the surgeon is just slang deformity parameters or frame position relative to reference bone segment.

In the software, the strut length entries are validated against the type (size) of struts selected. If the entered value exceeded the range for any given strut, an error is indicated and the strut size/length should be corrected prior to proceeding to the next step (Fig. 23).

The screenshot shows the TL-HEX software interface. At the top, there is a navigation bar with 'Home Page', 'Cases', 'Patients', and 'Account'. Below this is a yellow banner with the text 'Please correct the following: Range:0-35'. A red arrow points to this banner. Below the banner are several tabs: 'Case Data', 'Deformity Parameters', 'Frame Parameters', 'Postoperative', 'End of Correction', 'Schedule', 'Prescription', 'Report', and 'Checkup'. The 'Postoperative' tab is selected. Below the tabs, there are fields for 'Case Number: 001', 'Case Name: Case 1', 'Patient ID: Patient A', and 'Side Selection: Left'. There are several input fields for parameters like 'Reference Ring AP Translation (mm)', 'Reference Ring ML Translation (mm)', 'Reference Ring Position (mm)', 'Reference Ring AP Angle (deg)', 'Reference Ring ML Angle (deg)', 'Frame Rotation (deg)', and 'Reference Ring Position'. Below these fields is an 'Update Views' button. There are three view windows: 'AP view', 'ML view', and 'Axial view'. At the bottom, there is a table with columns for 'Total', 'Strut 1 (mm): 234', 'Strut 2 (mm): 209', 'Strut 3 (mm): 162', 'Strut 4 (mm): 149', 'Strut 5 (mm): 179', and 'Strut 6 (mm): 239'. The table has rows for 'Size', 'Acute', and 'Gradual'. A red arrow points to the 'Gradual' row for 'Strut 4 (mm): 149', where the value is 36 and the error message 'Range:0-35' is displayed.

Total	Strut 1 (mm): 234	Strut 2 (mm): 209	Strut 3 (mm): 162	Strut 4 (mm): 149	Strut 5 (mm): 179	Strut 6 (mm): 239
Size	Long	Long	Long	Medium	Long	Long
Acute	0	0	0	16	11	15
Gradual	14	40	35	36	35	33

Fig. 23. Updated Postoperative screen, with errors related to incorrect strut lengths.

5.5 End of Correction

The **End of Correction** screen (Fig. 24) displays the position of the bone segments and the frame at the end of the treatment (deformity correction). The software assumes that, at the end of deformity correction, the bone segments should be in perfect alignment with no limb length discrepancy (amount of lengthening will be equal to the amount of limb length discrepancy value entered at the **Deformity Parameters** screen). The screen, however, provides the surgeon the opportunity to override the default position as desired. Additional adjustments include: coronal plane (**AP view**) and sagittal plane (**ML view**) angulation and translation and horizontal plane (**axial view**) internal/external rotation. The values entered represent the desired bone segment position at the end of deformity correction. This is useful if an overcorrection or undercorrection is desired at the end of deformity correction (e.g., Blount's deformity correction, where a 10-degree overcorrection is desired).

Total	Strut 1 (mm): 200	Strut 2 (mm): 210	Strut 3 (mm): 252	Strut 4 (mm): 229	Strut 5 (mm): 263	Strut 6 (mm): 212
Size	Long	Long	Long	Long	Long	Long
Acute	0	0	14	72	25	15
Gradual	38	28	0	80	0	41

Fig. 24. End of Correction screen.

Click on **Update Views** and check the bottom of the screen for struts that are out of range (indicated by a red number). An out of range strut can be addressed by modifying the parameters (over/under or bone length) at the top of the **End of Correction** Screen.

Note: The **End of Correction** Screen is intended to identify if any struts go out of range during the treatment schedule. The total

strut length is accurate however the distribution of acute/gradual adjustment length may be different from [End of Correction](#) to last day of the [Report](#) because [End of Correction](#) does not take into account any strut modifications (acute adjustment or strut exchange). The [Report](#) should be referenced for final strut position (acute and gradual) and strut type.

5.6 Schedule

The [Schedule](#) screen (Fig. 25) allows the surgeon to enter or calculate various parameters related to bone segment movement during the deformity correction. Those parameters include: maximum rate of bone segment translation (mm/day), maximum rate of bone segment rotation (degree/day), maximum rate of bone segment angular correction (degrees/day), treatment start date (surgery date plus latency period), and rhythm of correction (number and time of adjustments per day). As a safety mechanism, the software will always default to the slowest of the three calculated rates.

The Correction Times table provides the flexibility to have the prescription calculated for one or more adjustments during each treatment day.

Fig. 25. Schedule screen.

If continuing to the [Schedule](#) screen with struts out of range, then once [Next](#) is clicked, the surgeon will be advised via a pop-up window that struts are out of range.

5.7 Prescription

The Prescription screen (Fig. 26) displays the adjustment schedule for the patient resulting from the previously entered parameters. Each row in the prescription describes the strut adjustment for the patient to make for each deformity correction step as specified in the schedule. Adjustment for each strut is represented by number of clicks (1/2 rotation of the strut adjustment knob) and can be positive (if strut length increases) or negative (when the strut length decreases). In addition, the gradual adjustment scale value in millimeters is displayed as a reference for each strut.

Note: All information must be reviewed by the surgeon before completing and printing the prescription to ensure that it is accurate.

The screenshot shows the 'Prescription' screen in the TL-HEX software. At the top, there are navigation tabs: Home Page, Cases, Patients, Account, Case Data, Deformity Parameters, Frame Parameters, Postoperative, End of Correction, Schedule, Prescription (active), Report, and Checkup. Below these, case information is displayed: Case Number: 001, Case Name: Case 1, Patient ID: Patient A, Side Selection: Left. A 'Print Prescription' button is visible.

The main section is titled 'Strut Adjustments in 'CLICKS'' and 'Strut Reference Length (mm)'. It contains a table with 13 rows of adjustment data. The columns are: No, Date-Time, and six pairs of color-coded columns (Red, Orange, Yellow, Green, Blue, Purple) for Struts 1 through 6. Each pair includes a 'CLICKS' value and a 'mm' value. The table also has 'View Image' and 'See In Report' links for each row.

No	Date-Time	Red Strut1	Orange Strut2	Yellow Strut3	Green Strut4	Blue Strut5	Purple Strut6	Red Strut1	Orange Strut2	Yellow Strut3	Green Strut4	Blue Strut5	Purple Strut6	View Image	See In Report
0	04/09/2012 00:00	0	0	0	0	0	0	14	40	34	34	34	33	View	In Report
1	04/09/2012 08:00	0	0	+1	+2	+1	0	14	40	34	34	34	33	View	In Report
2	04/09/2012 20:00	-1	+1	+2	+3	+2	0	14	40	34	32	34	33	View	In Report
3	05/09/2012 08:00	0	0	+1	+3	+1	0	15	39	33	31	33	33	View	In Report
4	05/09/2012 20:00	-1	+1	+2	+3	+2	0	15	39	32	29	32	33	View	In Report
5	06/09/2012 08:00	0	0	+1	+4	+1	0	15	39	31	28	31	33	View	In Report
6	06/09/2012 20:00	-1	+1	+2	+3	+2	0	15	39	31	26	31	33	View	In Report
7	07/09/2012 08:00	0	0	+1	+3	+1	0	16	38	30	25	30	33	View	In Report
8	07/09/2012 20:00	-1	+1	+2	+3	+2	0	16	38	29	23	28	33	View	In Report
9	08/09/2012 08:00	0	0	+1	+3	+1	0	16	38	28	21	26	33	View	In Report
10	08/09/2012 20:00	-1	+1	+2	+3	+2	0	16	38	28	20	28	33	View	In Report
11	09/09/2012 08:00	-1	0	+1	+3	+1	0	17	37	27	18	27	33	View	In Report
12	09/09/2012 20:00	0	+1	+2	+3	+2	0	17	37	26	17	26	33	View	In Report
13	10/09/2012 08:00	-1	0	+2	+3	+1	0	17	37	25	15	25	33	View	In Report

Below the table are three 3D views of the hexapod system: AP view, ML view, and Axial view. Each view shows the struts in different colors and their positions relative to the patient's anatomy. Below the views, the following parameters are listed:

- AP Angle: 25 deg, Valgus
- AP Translation: 0 mm
- ML Angle: 25 deg, ApexAnterior
- ML Translation: 0 mm
- Rotation: 0 deg
- Axial Translation: 0 mm

At the bottom, there are 'Previous' and 'Next' buttons, and a footer with links for Privacy Policy, EULA Policy, Cookies, Contact Us, and Instructions for Use.

Fig. 26. Prescription screen view before starting the adjustments.

By clicking on **View** in the prescription table, the three views of the deformity and frame will be displayed for the corresponding day/time of the prescription (Fig. 27).

The screenshot displays the TL-HEX software interface. At the top, there are navigation tabs: Home Page, Cases, Patients, and Account. Below these are sub-tabs for Case Data, Deformity Parameters, Frame Parameters, Postoperative, End of Correction, Schedule, Prescription, Report, and Checkup. The Prescription tab is active, showing Case Number: 001, Case Name: Case 1, Patient ID: Patient A, and Side Selection: Left. A 'Print Prescription' button is visible.

The main section is titled 'Strut Adjustments in 'CLICKS'' and 'Strut Reference Length (mm)'. It contains a table with columns for No, Date-Time, and six pairs of struts (Strut1-Strut6) for Red, Orange, Yellow, Green, Blue, and Purple. Each pair has a 'CLICKS' value and a 'Reference Length (mm)' value. A 'View Image' link is provided for each row.

No	Date-Time	Red Strut1	Orange Strut2	Yellow Strut3	Green Strut4	Blue Strut5	Purple Strut6	Red Strut1	Orange Strut2	Yellow Strut3	Green Strut4	Blue Strut5	Purple Strut6	View Image	See In Rep.
0	05/09/2012 00:00	0	0	0	0	0	0	14	40	35	35	35	33	View	In Report
1	05/09/2012 08:00	0	0	+1	+2	+1	0	14	40	34	34	34	33	View	In Report
2	05/09/2012 20:00	-1	+1	+2	+3	+2	0	14	40	34	32	34	33	View	In Report
3	06/09/2012 08:00	0	0	+1	+3	+1	0	15	39	33	31	33	33	View	In Report
4	06/09/2012 20:00	-1	+1	+2	+3	+2	0	15	39	32	29	32	33	View	In Report
5	07/09/2012 08:00	0	0	+1	+4	+1	0	15	39	31	28	31	33	View	In Report
6	07/09/2012 20:00	-1	+1	+2	+3	+2	0	15	39	31	26	31	33	View	In Report
7	08/09/2012 08:00	0	0	+1	+3	+1	0	16	38	30	25	30	33	View	In Report
8	08/09/2012 20:00	-1	+1	+2	+3	+2	0	16	38	29	23	29	33	View	In Report
9	09/09/2012 08:00	0	0	+1	+3	+1	0	16	38	28	21	28	33	View	In Report
10	09/09/2012 20:00	-1	+1	+2	+3	+2	0	16	38	28	20	28	33	View	In Report
11	10/09/2012 08:00	-1	0	+1	+3	+1	0	17	37	27	18	27	33	View	In Report
12	10/09/2012 20:00	0	+1	+2	+3	+2	0	17	37	26	17	26	33	View	In Report
13	11/09/2012 08:00	-1	0	+2	+3	+1	0	17	37	25	15	25	33	View	In Report

Below the table are three 3D views of the deformity and frame:

- AP view:** Shows the deformity and frame from an Anterior-Posterior perspective. Labels: Medial, Lateral.
- ML view:** Shows the deformity and frame from a Medial-Lateral perspective. Labels: Posterior, Anterior.
- Axial view:** Shows the deformity and frame from an Axial perspective. Labels: Lateral, Medial, Posterior.

Summary statistics for the views:

- AP Angle: 21 deg, Valgus; AP Translation: 0 mm
- ML Angle: 21 deg, ApexAnterior; ML Translation: 0 mm
- Rotation: 0 deg; Axial Translation: 3 mm, Long

Navigation buttons: Previous, Next.

Footer: Privacy Policy | EULA Policy | Cookies | Contact Us | Instructions for Use.

Fig. 27. Prescription screen view after starting the adjustments.

Clicking **Print Prescription** will generate a prescription in PDF format (Fig. 28). This document must then be printed and the hard copy must be issued to the patient and can also be saved for the record. The print-out should be checked for correctness and readability and the patient should be instructed to contact the surgeon in case the prescription becomes lost or damaged.

Note: Please review all information before completing and printing the prescription to ensure that it is accurate.

Prescription Print Date: 20 August 2012 14:27

Dr. Member One
22222 Main St
Denton Texas 76201
214-555-5555

Case Number: 001
Case Name: Case 1
Patient ID: Patient A
Side Selection: Left

No	Date-Time	Strut Adjustments (clicks)						Strut Reference Length (mm)					
		Red	Orange	Yellow	Green	Blue	Purple	Red	Orange	Yellow	Green	Blue	Purple
0	00:00:00.00	0	0	0	0	0	0	14	40	55	55	55	55
1	04:00:00.00	0	0	+1	+2	+1	0	14	40	54	54	54	55
2	08:00:00.00	+1	+1	+0	+0	+0	0	14	40	54	52	54	55
3	12:00:00.00	0	0	+1	+0	+1	0	15	38	55	51	55	55
4	16:00:00.00	+1	+1	+0	+0	+2	0	15	38	52	52	52	55
5	20:00:00.00	0	0	+1	+4	+1	0	15	38	51	50	51	55
6	24:00:00.00	+1	+1	+0	+0	+0	0	15	38	51	50	51	55
7	28:00:00.00	0	0	+1	+0	+1	0	16	36	50	50	50	55
8	32:00:00.00	+1	+1	+0	+0	+0	0	16	36	50	50	50	55
9	36:00:00.00	0	0	+1	+0	+1	0	16	36	50	51	50	55
10	40:00:00.00	+1	+1	+0	+0	+2	0	16	36	50	50	50	55
11	44:00:00.00	+1	0	+1	+0	+1	0	17	37	50	49	50	55
12	48:00:00.00	0	+1	+0	+0	+2	0	17	37	50	49	50	55
13	52:00:00.00	+1	0	+0	+0	+1	0	17	37	50	49	50	55
14	56:00:00.00	0	0	+1	+4	+0	0	18	37	54	54	50	55
15	00:00:00.00	+1	+1	+0	+0	+1	0	18	37	54	52	54	55
16	04:00:00.00	0	0	+1	+0	+2	0	18	36	53	51	53	55
17	08:00:00.00	+1	+1	+0	+0	+1	0	18	36	52	5	52	55
18	12:00:00.00	+1	0	+1	+0	+2	-1	19	36	51	0	52	55
19	16:00:00.00	0	+1	+0	+0	+1	0	19	36	51	0	51	55
20	20:00:00.00	+1	0	+1	+0	+0	0	19	36	50	0	50	55
21	24:00:00.00	0	0	+0	+0	+1	0	20	35	50	0	50	55
22	28:00:00.00	+1	+1	+0	+0	+2	0	20	35	50	1	50	54
23	32:00:00.00	+1	0	+0	0	+1	0	20	35	50	1	50	54
24	36:00:00.00	0	+1	+1	+0	+0	0	21	35	47	47	47	54
25	40:00:00.00	+1	0	+0	+0	+1	0	21	34	50	50	50	54
26	44:00:00.00	+1	0	+1	+0	+2	-1	21	34	50	50	50	54
27	48:00:00.00	0	+1	+0	+0	+0	0	22	34	50	50	50	54
28	52:00:00.00	+1	0	+1	+0	+0	0	22	34	54	54	51	54
29	56:00:00.00	+1	+1	+0	+0	+1	0	22	34	53	49	53	54
30	00:00:00.00	0	0	+1	+0	+2	0	23	34	52	49	53	54
31	04:00:00.00	+1	0	+0	+0	+1	-1	23	34	52	46	52	54
32	08:00:00.00	+1	+1	+1	+0	+0	0	23	33	51	49	51	54
33	12:00:00.00	0	0	+0	+0	+1	0	24	33	50	49	50	54
34	16:00:00.00	+1	0	+1	+0	+2	0	24	33	0	42	50	55
35	20:00:00.00	+1	+1	+0	+0	+1	0	24	33	0	40	0	55
36	24:00:00.00	0	0	+1	+0	+0	-1	25	32	0	39	0	55
37	28:00:00.00	+1	0	+0	+0	+1	0	25	32	7	37	0	55
38	32:00:00.00	+1	+1	+1	+0	+2	0	25	32	0	36	0	55
39	36:00:00.00	+1	0	+0	+0	+1	0	26	32	0	34	0	55
40	40:00:00.00	0	0	+1	+0	+0	-1	26	32	0	33	0	55
41	44:00:00.00	+1	+1	+0	+0	+1	0	27	32	4	31	4	55
42	48:00:00.00	+1	0	+1	+0	+2	0	27	31	0	30	4	55
43	52:00:00.00	+1	0	+0	+0	+1	-1	27	31	0	28	0	55
44	56:00:00.00	0	+1	+1	+0	+1	0	28	31	2	27	2	55
45	00:00:00.00	+1	0	+0	+0	+2	0	28	31	0	25	0	55
46	04:00:00.00	+1	0	+1	+0	+1	-1	28	31	0	24	0	55
47	08:00:00.00	+1	+1	0	+0	+2	0	29	31	19	22	0	55
48	12:00:00.00	+1	0	+1	+2	0	0	29	31	37	21	0	57
49	16:00:00.00	0	0	+0	+0	+1	-1	30	30	37	20	0	57
50	20:00:00.00	+1	0	+1	+0	+0	0	30	30	36	20	0	57
51	24:00:00.00	+1	+1	+0	+0	+1	0	31	30	35	17	0	57
52	28:00:00.00	+1	0	+1	+0	+2	-1	31	30	35	16	0	57
53	32:00:00.00	+1	0	+0	+0	+1	0	31	30	34	14	0	59
54	36:00:00.00	+1	0	+1	+0	+1	0	32	30	33	13	0	59
55	40:00:00.00	0	+1	+1	+0	+2	-1	32	30	32	11	0	59
56	44:00:00.00	+1	0	+0	+0	+1	0	33	30	31	10	0	59
57	48:00:00.00	+1	0	+1	+0	+2	0	33	29	30	9	0	59
58	52:00:00.00	+1	+1	+0	+0	+1	-1	34	29	29	8	0	59
59	56:00:00.00	+1	0	+1	+0	+1	0	35	29	28	7	0	59
60	00:00:00.00	+1	0	+1	+0	+2	0	35	29	27	6	0	59
61	04:00:00.00	+1	+1	+0	+0	+1	-1	36	29	26	5	0	59
62	08:00:00.00	+1	0	+1	+0	+1	0	37	29	25	4	0	59
63	12:00:00.00	+1	+1	+0	+0	+1	-1	37	28	24	3	0	59
64	16:00:00.00	+1	0	+1	+0	+1	0	37	28	23	2	0	59
65	20:00:00.00	+1	0	+0	+0	+2	-1	37	28	22	1	0	59
66	24:00:00.00	+1	0	+1	+0	+1	0	37	28	21	0	0	59
67	28:00:00.00	+1	0	+1	+0	+1	0	37	28	20	0	0	59
68	32:00:00.00	0	0	0	+1	0	0	38	28	19	0	0	59

Fig. 28. Prescription hard copy for the patient.

The direction clips are then applied to the rod end joints according to the prescription. If strut elongation is required (positive numbers in the prescription), the arrow on the clip should point in the same direction as the reference arrow on the adjustment knob (Fig. 29 a). If strut shortening is required (negative numbers in the prescription), the clip should be applied with the arrow pointing in the opposite direction of the arrow on the adjustment knob (Fig. 29 b).

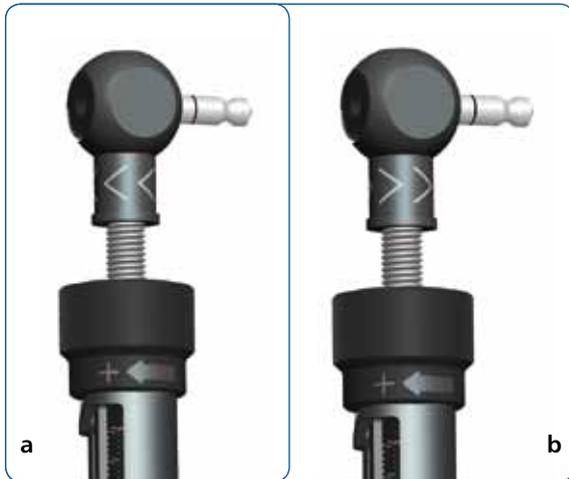


Fig. 29. Orientation of direction clips for strut elongation (a) and shortening (b).

In most of the cases, the orientation of direction clips remains the same throughout the treatment. In some cases with a rotational deformity correction, the direction of strut adjustments in the prescription may change from positive to negative or from negative to positive. In this situation, the surgeon should instruct the patient about the day the change of direction occurs and either schedule a clinic visit for the orientation change of the direction clip or instruct the patient on how to make this orientation change to the direction clip.

In addition, the direction of strut adjustment may change from positive to negative in cases of extreme elongation of the long strut (acute adjustment indicates 80 mm and gradual adjustment indicates 0 mm left on the strut scale) even though additional strut elongation is still required. This situation may occur when external supports are placed too far from each other and maximal elongation of the longest available strut is not enough to achieve the desired amount. The surgeon should review the acute/gradual indication numbers in the [Report](#) screen either preoperatively to adjust the ring separation distance or postoperatively to schedule frame modifications on time.

The prescription row will be highlighted when strut readjustment (shaded blue) or exchange (shaded red) are required (Fig. 30). The rows of lighter shading indicate the allowable range of days that are suitable for the readjustment/exchange; the heavier shaded row indicates the last possible day for the strut change.

If the strut readjustment/exchange occurs on the last day (marked by the solid color blue/red box), the existent prescription can be used. If the strut readjustment/exchange occurs prior to the last day, a new prescription must be generated from that date. The [Checkup](#) screen can be used to create a new case.

If strut exchange is required shortly after the beginning of correction and was done before starting the correction, the surgeon should return to the [Postoperative](#) screen and move through the End of Correction to re-generate a prescription.

Note: Please review all information before completing and printing the prescription to ensure that it is accurate.

TL-HEX TRUELOK HEXAPOD SYSTEM

ORTHOFIX

Home Page Cases Patients Account

Case Data Deformity Parameters Frame Parameters Postoperative End of Correction Schedule Prescription Report Checkup

Case Numbers: 001 Case Name: Case 1 Patient ID: Patient A Side Selection: Left

Please review all information before completing and printing the prescription to ensure that it is accurate. [Print Prescription](#)

Strut Adjustments in 'CLICKS'								Strut Reference Length (mm)							
19	13/09/2012 08:00	0	+1	+2	+3	+1	0	19	36	21	6	21	33	View	In Report
20	13/09/2012 20:00	-2	0	+1	+3	+2	0	19	36	22	5	20	33	View	In Report
21	14/09/2012 08:00	0	0	+2	+3	+1	0	20	35	19	3	19	33	View	In Report
22	14/09/2012 20:00	-1	+1	+1	+3	+2	0	20	35	18	1	19	34	View	In Report
23	15/09/2012 08:00	-1	0	+2	0	+1	0	20	35	18	0	18	34	View	In Report
24	15/09/2012 20:00	0	+1	+1	+2	+2	0	21	35	17	77	17	34	View	In Report
25	16/09/2012 08:00	-1	0	+2	+3	+1	0	21	34	16	75	16	34	View	In Report
26	16/09/2012 20:00	-1	0	+1	+3	+2	-1	21	34	15	74	16	34	View	In Report
27	17/09/2012 08:00	0	+1	+2	+3	+1	0	22	34	15	72	15	34	View	In Report
28	17/09/2012 20:00	-1	0	+1	+3	+2	0	22	34	14	71	14	34	View	In Report
29	18/09/2012 08:00	-1	+1	+2	+3	+1	0	22	34	13	69	13	34	View	In Report
30	18/09/2012 20:00	0	0	+1	+3	+2	0	23	34	12	68	13	34	View	In Report
31	19/09/2012 08:00	-1	0	+2	+3	+1	-1	23	33	12	66	12	34	View	In Report
32	19/09/2012 20:00	-1	+1	+1	+1	+2	0	23	33	11	65	11	34	View	In Report
33	20/09/2012 08:00	0	0	+2	+3	+1	0	24	33	10	63	10	34	View	In Report
34	20/09/2012 20:00	-1	0	+1	+3	+2	0	24	33	9	62	10	35	View	In Report
35	21/09/2012 08:00	-1	+1	+2	+3	+1	0	24	33	9	60	9	35	View	In Report

AP view ML view Axial view

AP Angle: 17 deg, Valgus AP Translation: 0 mm ML Angle: 17 deg, ApexAnterior ML Translation: 0 mm Rotation: 0 deg Axial Translation: 6 mm, Long

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Fig. 30. Prescription screen indicating strut readjustment (blue) and strut exchange (red).

5.8 Report

The Report provides a more detailed prescription for the physician. In addition to patient prescription, this prescription includes acute and gradual adjustment values in millimeters for each strut (Fig. 31). These values should be checked by the surgeon, especially in cases with extreme compression of the short struts.

No	Date-Time	Red		Orange		Yellow		Green		Blue		Purple		Generate Views	See In Prescription
		R1	A G	O1	A G	Y1	A G	G1	A G	B1	A G	P1	A G		
1	04/28/2012 08:00	long	0 14	long	0 40	long	0 34	med	16 34	long	11 34	long	15 33	View	Prescription
2	04/28/2012 20:00	long	0 14	long	0 40	long	0 34	med	16 32	long	11 34	long	15 33	View	Prescription
3	05/09/2012 08:00	long	0 15	long	0 39	long	0 33	med	16 31	long	11 33	long	15 33	View	Prescription
4	05/09/2012 20:00	long	0 15	long	0 39	long	0 32	med	16 29	long	11 32	long	15 33	View	Prescription
5	06/05/2011 08:00	long	0 18	long	0 29	long	0 31	med	16 28	long	11 31	long	15 33	View	Prescription
6	06/05/2012 20:00	long	0 15	long	0 29	long	0 31	med	16 26	long	11 31	long	15 33	View	Prescription
7	07/29/2011 08:00	long	0 16	long	0 38	long	0 30	med	16 25	long	11 30	long	15 33	View	Prescription
8	07/29/2012 20:00	long	0 16	long	0 38	long	0 29	med	16 23	long	11 29	long	15 33	View	Prescription
9	08/05/2012 08:00	long	0 16	long	0 38	long	0 28	med	16 21	long	11 28	long	15 33	View	Prescription
10	08/05/2012 20:00	long	0 16	long	0 38	long	0 28	med	16 20	long	11 28	long	15 33	View	Prescription
11	08/06/2012 08:00	long	0 17	long	0 37	long	0 27	med	16 18	long	11 27	long	15 33	View	Prescription
12	08/06/2012 20:00	long	0 17	long	0 37	long	0 28	med	16 17	long	11 26	long	15 33	View	Prescription
13	10/09/2012 08:00	long	0 17	long	0 37	long	0 25	med	16 16	long	11 25	long	15 33	View	Prescription

Fig. 31. Report screen view before starting adjustments.

In such a situation when acute adjustment indicates 0 mm and gradual adjustment indicates 15 mm on the strut scale, the external supports were placed too close to each other and maximal shortening of the shortest strut is not enough to achieve the desired amount. If gradual adjustment on the report indicates numbers higher than 15.0 mm, then a frame modification is required to continue compression.

By clicking on the View link for any day in the prescription table, the system will generate a view of the bone segments and frame orientation of that particular day (Fig. 32).

TL-HEX
TRUELOK HEXAPOD SYSTEM

ORTHOFIX

Home Page Cases Patients Account

Case Data Deformity Parameters Frame Parameters Postoperative End of Correction Schedule Prescription Report **Report** Checkup

Case Number: 001
Case Name: Case 1

Patient ID: Patient A
Side Selection: Left

Print Report

Strut Length A-Acute / G-Gradual (mm)

34	20/09/2012 20:00	long	0	24	long	0	33	long	0	9	long	5	82	long	11	10	long	15	35	View	Prescription
35	21/09/2012 08:00	long	0	24	long	0	33	long	0	9	long	5	80	long	11	9	long	15	35	View	Prescription
36	31/09/2012 20:00	long	0	25	long	0	32	long	0	8	long	5	59	long	11	8	long	15	35	View	Prescription
37	22/09/2012 08:00	long	0	25	long	0	32	long	0	7	long	5	57	long	11	7	long	15	35	View	Prescription
38	22/09/2012 20:00	long	0	25	long	0	32	long	0	8	long	5	56	long	11	7	long	15	35	View	Prescription
39	23/09/2012 08:00	long	0	26	long	0	32	long	0	6	long	5	54	long	11	6	long	15	35	View	Prescription
40	23/09/2012 20:00	long	0	26	long	0	32	long	0	5	long	5	53	long	11	5	long	15	35	View	Prescription
41	24/09/2012 08:00	long	-1	27	long	-1	32	long	-3	4	long	5	51	long	11	4	long	15	35	View	Prescription
42	24/09/2012 20:00	long	0	27	long	0	31	long	0	3	long	5	50	long	11	4	long	15	36	View	Prescription
43	25/09/2012 08:00	long	0	27	long	0	31	long	0	3	long	5	48	long	11	3	long	15	36	View	Prescription
44	25/09/2012 20:00	long	0	28	long	0	31	long	0	2	long	5	47	long	11	2	long	15	36	View	Prescription
45	26/09/2012 08:00	long	0	28	long	0	31	long	0	1	long	5	45	long	11	2	long	15	36	View	Prescription
46	26/09/2012 20:00	long	0	28	long	0	31	long	0	0	long	5	44	long	11	1	long	15	36	View	Prescription
47	27/09/2012 08:00	long	0	29	long	0	31	long	-1	0	long	5	42	long	11	0	long	15	36	View	Prescription
48	27/09/2012 20:00	long	0	29	long	0	31	long	78	77	long	5	41	long	11	0	long	15	37	View	Prescription
49	28/09/2012 08:00	long	0	30	long	0	30	long	78	77	long	5	39	long	11	0	long	15	37	View	Prescription
50	28/09/2012 20:00	long	0	30	long	0	30	long	76	76	long	5	38	long	11	0	long	15	37	View	Prescription

AP view

AP Angle: 9 deg, Valgus
AP Translation: 0 mm

ML view

ML Angle: 9 deg, ApexAnterior
ML Translation: 0 mm

Axial view

Rotation: 0 deg
Axial Translation: 12 mm, Long

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Fig. 32. Report screen view after starting the adjustments.

Similar to Prescription screen, the report row will be highlighted when strut readjustments (shaded blue) or exchanges (shaded red) are required (Fig. 33). The rows of lighter shading indicate the allowable range of days that are suitable for the readjustment/exchange; the heavier shaded row indicates the last possible day for the readjustment/exchange.

The screenshot displays the 'Report' screen in the TL-HEX software. At the top, there are navigation tabs: Home Page, Cases, Patients, Account, Case Data, Deformity Parameters, Frame Parameters, Postoperative, End of Correction, Schedule, Prescription, Report, and Checkup. The 'Report' tab is active. Below the navigation, case information is shown: Case Number: 001, Case Name: Case 1, Patient ID: Patient A, Side Selection: Left. A 'Print Report' button is present. The main data is a table titled 'Strut Length A-Acute / G-Gradual (mm)'. The table has columns for dates and various strut lengths. Some cells are highlighted in red (indicating exchange) or blue (indicating readjustment). Below the table are three 3D views: AP view, ML view, and Axial view. Each view shows the orthopedic device with struts in different colors. Below the views, specific parameters are listed: AP Angle: 9 deg. Valgus, AP Translation: 0 mm; ML Angle: 9 deg. ApexAnterior, ML Translation: 0 mm; Rotation: 0 deg, Axial Translation: 12 mm, Long. At the bottom, there are 'Previous' and 'Next' buttons, and a footer with links for Privacy Policy, EULA Policy, Cookies, Contact Us, and Instructions for Use.

Date	Strut 1	Strut 2	Strut 3	Strut 4	Strut 5	Strut 6	Strut 7	Strut 8	Strut 9	Strut 10	Strut 11	Strut 12	Strut 13	Strut 14	Strut 15	Strut 16	Strut 17	Strut 18	Strut 19	Strut 20	Strut 21	Strut 22	Strut 23	Strut 24	Strut 25	Strut 26	Strut 27	Strut 28	Strut 29	Strut 30	Strut 31	Strut 32	Strut 33	Strut 34	Strut 35	Strut 36	Strut 37	Strut 38	Strut 39	Strut 40	Strut 41	Strut 42	Strut 43	Strut 44	Strut 45	Strut 46	Strut 47	Strut 48	Strut 49	Strut 50	Strut 51	Strut 52	Strut 53	Strut 54	Strut 55	Strut 56	Strut 57	Strut 58	Strut 59	Strut 60	Strut 61	Strut 62	Strut 63	Strut 64	Strut 65	Strut 66	Strut 67	Strut 68	Strut 69	Strut 70	Strut 71	Strut 72	Strut 73	Strut 74	Strut 75	Strut 76	Strut 77	Strut 78	Strut 79	Strut 80	Strut 81	Strut 82	Strut 83	Strut 84	Strut 85	Strut 86	Strut 87	Strut 88	Strut 89	Strut 90	Strut 91	Strut 92	Strut 93	Strut 94	Strut 95	Strut 96	Strut 97	Strut 98	Strut 99	Strut 100
14/09/2012 08:00	long	0	20	long	0	35	long	0	19	med	18	3	long	11	19	long	15	33	View	Prescription																																																																																
14/09/2012 20:00	long	0	20	long	0	35	long	0	18	med	18	3	long	11	19	long	15	34	View	Prescription																																																																																
15/09/2012 08:00	long	0	20	long	0	35	long	0	18	med	18	3	long	11	18	long	15	34	View	Prescription																																																																																
15/09/2012 20:00	long	0	21	long	0	35	long	0	17	long	5	77	long	11	17	long	15	34	View	Prescription																																																																																
16/09/2012 08:00	long	0	21	long	0	34	long	0	16	long	5	75	long	11	16	long	15	34	View	Prescription																																																																																
16/09/2012 20:00	long	0	21	long	0	34	long	0	15	long	5	74	long	11	16	long	15	34	View	Prescription																																																																																
17/09/2012 08:00	long	0	22	long	0	34	long	0	15	long	5	72	long	11	15	long	15	34	View	Prescription																																																																																
17/09/2012 20:00	long	0	22	long	0	34	long	0	14	long	5	71	long	11	14	long	15	34	View	Prescription																																																																																
18/09/2012 08:00	long	0	22	long	0	34	long	0	13	long	5	69	long	11	13	long	15	34	View	Prescription																																																																																
18/09/2012 20:00	long	0	23	long	0	34	long	0	12	long	5	68	long	11	13	long	15	34	View	Prescription																																																																																
19/09/2012 08:00	long	0	23	long	0	33	long	0	12	long	5	66	long	11	12	long	15	34	View	Prescription																																																																																
19/09/2012 20:00	long	0	23	long	0	33	long	0	11	long	5	65	long	11	11	long	15	34	View	Prescription																																																																																
20/09/2012 08:00	long	0	24	long	0	33	long	0	10	long	5	63	long	11	10	long	15	34	View	Prescription																																																																																
20/09/2012 20:00	long	0	24	long	0	33	long	0	9	long	5	62	long	11	10	long	15	35	View	Prescription																																																																																
21/09/2012 08:00	long	0	24	long	0	33	long	0	9	long	5	60	long	11	9	long	15	35	View	Prescription																																																																																
21/09/2012 20:00	long	0	25	long	0	32	long	0	8	long	5	59	long	11	8	long	15	35	View	Prescription																																																																																
22/09/2012 08:00	long	0	25	long	0	32	long	0	7	long	5	57	long	11	7	long	15	35	View	Prescription																																																																																

Fig. 33. Report screen indicating strut readjustment (blue) and strut exchange (red).

Clicking **Print Report** will generate a report in PDF format (Fig. 34). This document can be printed and can also be saved for the record.

Case Number: 001
Case Name: Case 1
Patient ID: Patient A
Side Selection: Left

No	Date-Time	Red			Orange			Yellow			Green			Blue			Purple		
		R	A	G	R	A	G	R	A	G	R	A	G	R	A	G	R	A	G
0	04/09/2012 00:00	long	0	14	long	0	40	long	0	35	med	16	35	long	11	35	long	15	33
1	04/09/2012 08:00	long	0	14	long	0	40	long	0	34	med	16	34	long	11	34	long	15	33
2	04/09/2012 20:00	long	0	14	long	0	40	long	0	34	med	16	32	long	11	34	long	15	33
3	05/09/2012 08:00	long	0	15	long	0	39	long	0	33	med	16	31	long	11	33	long	15	33
4	05/09/2012 20:00	long	0	15	long	0	39	long	0	32	med	16	29	long	11	32	long	15	33
5	06/09/2012 08:00	long	0	15	long	0	39	long	0	31	med	16	28	long	11	31	long	15	33
6	06/09/2012 20:00	long	0	15	long	0	39	long	0	31	med	16	26	long	11	31	long	15	33
7	07/09/2012 08:00	long	0	16	long	0	38	long	0	30	med	16	25	long	11	30	long	15	33
8	07/09/2012 20:00	long	0	16	long	0	38	long	0	29	med	16	23	long	11	29	long	15	33
9	08/09/2012 08:00	long	0	16	long	0	38	long	0	28	med	16	21	long	11	28	long	15	33
10	08/09/2012 20:00	long	0	16	long	0	38	long	0	28	med	16	20	long	11	28	long	15	33
11	09/09/2012 08:00	long	0	17	long	0	37	long	0	27	med	16	18	long	11	27	long	15	33
12	09/09/2012 20:00	long	0	17	long	0	37	long	0	26	med	16	17	long	11	26	long	15	33
13	10/09/2012 08:00	long	0	17	long	0	37	long	0	25	med	16	15	long	11	25	long	15	33
14	10/09/2012 20:00	long	0	18	long	0	37	long	0	24	med	16	14	long	11	25	long	15	33
15	11/09/2012 08:00	long	0	18	long	0	37	long	0	24	med	16	12	long	11	24	long	15	33
16	11/09/2012 20:00	long	0	18	long	0	36	long	0	23	med	16	11	long	11	23	long	15	33
17	12/09/2012 08:00	long	0	18	long	0	36	long	0	22	med	16	9	long	11	22	long	15	33
18	12/09/2012 20:00	long	0	19	long	0	36	long	0	21	med	16	8	long	11	22	long	15	33
19	13/09/2012 08:00	long	0	19	long	0	36	long	0	21	med	16	6	long	11	21	long	15	33
20	13/09/2012 20:00	long	0	19	long	0	35	long	0	20	med	16	5	long	11	20	long	15	33
21	14/09/2012 08:00	long	0	20	long	0	35	long	0	19	med	16	3	long	11	19	long	15	33
22	14/09/2012 20:00	long	0	20	long	0	35	long	0	18	med	16	1	long	11	19	long	15	34
23	15/09/2012 08:00	long	0	20	long	0	35	long	0	18	long	5	78	long	11	18	long	15	34
24	15/09/2012 20:00	long	0	21	long	0	35	long	0	17	long	5	77	long	11	17	long	15	34
25	16/09/2012 08:00	long	0	21	long	0	34	long	0	16	long	5	75	long	11	16	long	15	34
26	16/09/2012 20:00	long	0	21	long	0	34	long	0	15	long	5	74	long	11	16	long	15	34
27	17/09/2012 08:00	long	0	22	long	0	34	long	0	15	long	5	72	long	11	15	long	15	34
28	17/09/2012 20:00	long	0	22	long	0	34	long	0	14	long	5	71	long	11	14	long	15	34
29	18/09/2012 08:00	long	0	22	long	0	34	long	0	13	long	5	69	long	11	13	long	15	34
30	18/09/2012 20:00	long	0	23	long	0	34	long	0	12	long	5	68	long	11	13	long	15	34
31	19/09/2012 08:00	long	0	23	long	0	33	long	0	12	long	5	66	long	11	12	long	15	34
32	19/09/2012 20:00	long	0	23	long	0	33	long	0	11	long	5	65	long	11	11	long	15	34
33	20/09/2012 08:00	long	0	24	long	0	33	long	0	10	long	5	63	long	11	10	long	15	34
34	20/09/2012 20:00	long	0	24	long	0	33	long	0	9	long	5	62	long	11	10	long	15	35
35	21/09/2012 08:00	long	0	24	long	0	33	long	0	9	long	5	60	long	11	9	long	15	35
36	21/09/2012 20:00	long	0	25	long	0	32	long	0	8	long	5	59	long	11	8	long	15	35
37	22/09/2012 08:00	long	0	25	long	0	32	long	0	7	long	5	57	long	11	7	long	15	35
38	22/09/2012 20:00	long	0	25	long	0	32	long	0	6	long	5	56	long	11	7	long	15	35
39	23/09/2012 08:00	long	0	26	long	0	32	long	0	6	long	5	54	long	11	6	long	15	35
40	23/09/2012 20:00	long	0	26	long	0	32	long	0	5	long	5	53	long	11	5	long	15	35
41	24/09/2012 08:00	long	0	27	long	0	32	long	0	4	long	5	51	long	11	4	long	15	36
42	24/09/2012 20:00	long	0	27	long	0	31	long	0	3	long	5	50	long	11	4	long	15	36
43	25/09/2012 08:00	long	0	27	long	0	31	long	0	3	long	5	48	long	11	3	long	15	36
44	25/09/2012 20:00	long	0	28	long	0	31	long	0	2	long	5	47	long	11	2	long	15	36
45	26/09/2012 08:00	long	0	28	long	0	31	long	0	1	long	5	45	long	11	2	long	15	36
46	26/09/2012 20:00	long	0	28	long	0	31	long	0	0	long	5	44	long	11	1	long	15	36
47	27/09/2012 08:00	long	0	29	long	0	31	long	78	78	long	5	42	long	11	0	long	15	36
48	27/09/2012 20:00	long	0	29	long	0	31	long	78	77	long	5	41	long	80	68	long	15	37
49	28/09/2012 08:00	long	0	30	long	0	30	long	78	77	long	5	39	long	80	68	long	15	37
50	28/09/2012 20:00	long	0	30	long	0	30	long	78	76	long	5	38	long	80	67	long	15	37
51	29/09/2012 08:00	long	0	31	long	0	30	long	78	75	long	5	37	long	80	66	long	15	37
52	29/09/2012 20:00	long	0	31	long	0	30	long	78	75	long	5	35	long	80	66	long	15	37
53	30/09/2012 08:00	long	0	31	long	0	30	long	78	74	long	5	34	long	80	65	long	15	38
54	30/09/2012 20:00	long	0	32	long	0	30	long	78	73	long	5	32	long	80	64	long	15	38
55	01/10/2012 08:00	long	0	32	long	0	30	long	78	72	long	5	31	long	80	64	long	15	38
56	01/10/2012 20:00	long	0	33	long	0	30	long	78	72	long	5	29	long	80	63	long	15	38
57	02/10/2012 08:00	long	0	33	long	0	29	long	78	71	long	5	28	long	80	62	long	15	38
58	02/10/2012 20:00	long	0	33	long	0	29	long	78	70	long	5	27	long	80	61	long	15	39
59	03/10/2012 08:00	long	0	34	long	0	29	long	78	70	long	5	25	long	80	61	long	15	39
60	03/10/2012 20:00	long	0	34	long	0	29	long	78	69	long	5	24	long	80	60	long	15	39
61	04/10/2012 08:00	long	0	35	long	0	29	long	78	68	long	5	22	long	80	59	long	15	39
62	04/10/2012 20:00	long	0	35	long	0	29	long	78	68	long	5	21	long	80	59	long	15	39
63	05/10/2012 08:00	long	0	36	long	0	29	long	78	67	long	5	20	long	80	58	long	15	40
64	05/10/2012 20:00	long	0	36	long	0	29	long	78	66	long	5	18	long	80	57	long	15	40
65	06/10/2012 08:00	long	0	37	long	0	29	long	78	65	long	5	17	long	80	57	long	15	40
66	06/10/2012 20:00	long	0	37	long	0	28	long	78	65	long	5	15	long	80	56	long	15	40
67	07/10/2012 08:00	long	0	37	long	0	28	long	78	64	long	5	14	long	80	55	long	15	41
68	07/10/2012 20:00	long	0	38	long	0	28	long	78	64	long	5	14	long	80	55	long	15	41

Fig. 34. Printed copy of the report.

5.9 Checkup

The **Checkup** screen (Fig. 35) provides the position of the bone segments and the frame with corresponding strut adjustment values at any particular day of treatment (deformity correction). When the **Checkup** screen is opened, it defaults to the Treatment Start Date. Use the Calendar to select the date the new case should begin. Click **Create New Case** and a new case will be generated using the parameters of the bone segment position and the strut length values (from the date selected) as the starting point. The **Create New Case** screen is used in the following situations:

- Changes in parameters of strut adjustment
- Unplanned strut readjustment or exchange
- Residual correction is required
- Next treatment phase for the staged correction

Before clicking on **Create New Case** the new case number and new case name can be entered into the corresponding fields. Clicking on **Create New Case** will open **Case Data** screen for the newly generated case. All the deformity and frame parameters will be transferred from the previous case at the date of check-up.

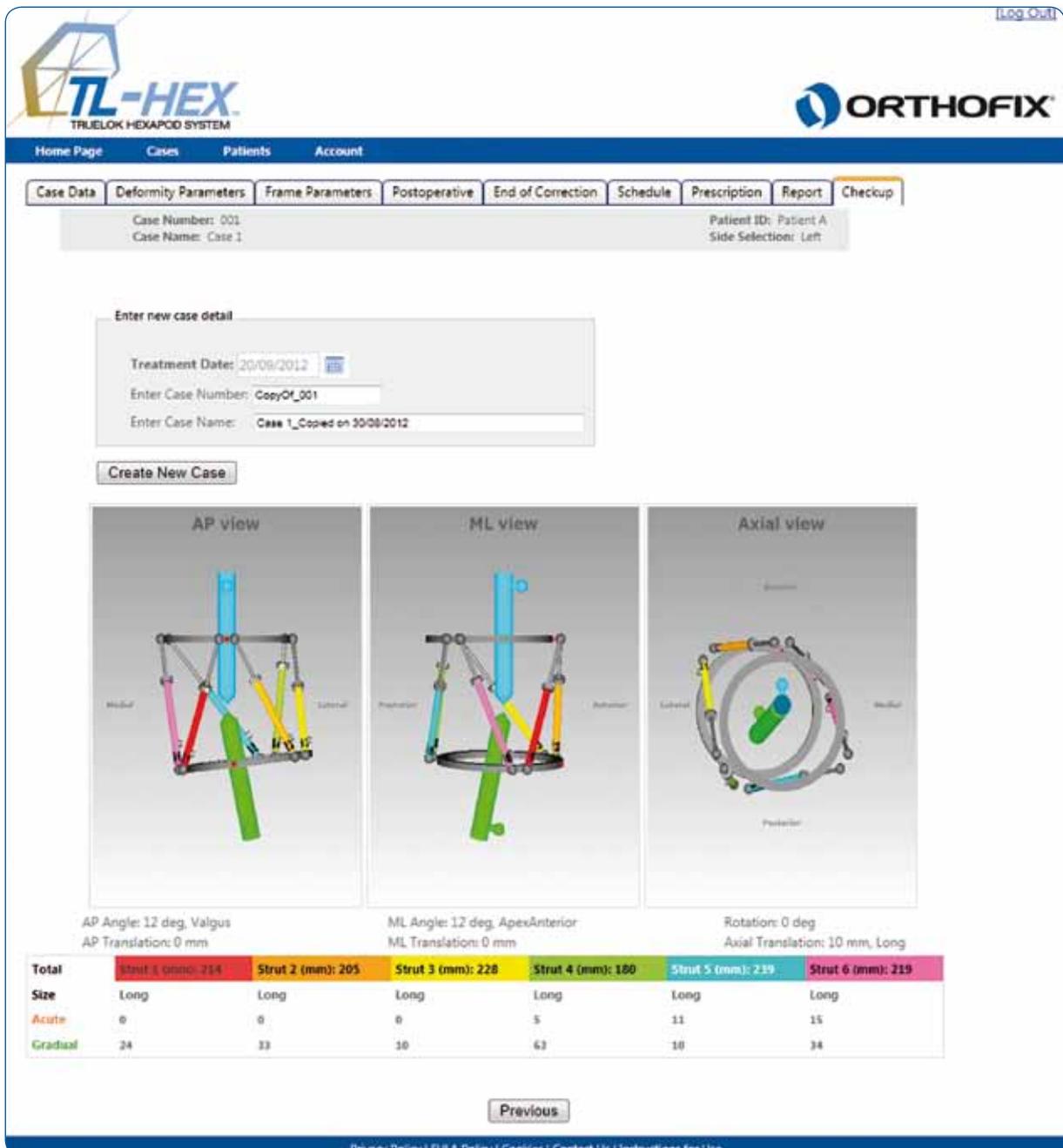


Fig. 35. Checkup screen.

The standard software steps are now followed to complete the new planning from this starting point (Fig. 36). Surgeon should check and adjust Deformity Parameters if necessary (Fig. 37). The Frame Parameters section should be skipped and surgeon should proceed to the Postoperative section where mounting parameters and strut parameters should be verified and adjusted if necessary. This will result in a new prescription for the patient, based on the starting point as chosen from the [Checkup](#) screen.

The screenshot displays the 'Create New Case' screen in the TL-HEX software. The interface features a header with the TL-HEX logo and the ORTHOFIX logo. Below the header is a navigation bar with 'Home Page', 'Cases', 'Patients', and 'Account'. The main content area has a series of tabs: 'Case Data', 'Deformity Parameters', 'Frame Parameters', 'Postoperative', 'End of Correction', 'Schedule', 'Prescription', 'Report', and 'Checkup'. The 'Case Data' tab is selected, showing a form with the following fields: Patient ID (Patient A), Case Number (Case 4), Case Name (Case four), Planning Created (30/08/2012), and Side Selection (Left). A 'New Notes' section contains the text 'Case Four by Dr. Arthur.'. A 'Notes History' window is open, displaying 'Case One Notes' with the text 'This case is generated on the: 30/08/2012 14:50:04 from case number: 001 (Case 1).' and 'Name: member1 - Date: 30/08/2012 14:50:04'. A 'Next' button is at the bottom. A warning box is also present: 'Warning! You are not allowed to enter or provide any information that allows, directly or indirectly, the identification of your patient (s.g. name, birth date, address, email-address, phone number etc.). Please use only an internal confidential code to identify your patient record when using this Software.'

Fig. 36. Create New Case screen.

Note: Surgeon should verify and if needed, re-enter the parameters (bone length or over/under correction).



Fig. 37. Verify deformity parameters.

6. Website Navigation

- In general, it is good practice to click the **Update Views** after making any changes to the on screen parameters. This will provide visual confirmation that the changes are as intended.
- Regardless of whether the **Update Views** is clicked after changing one or more parameters, the new parameters will be saved once either **Next** or one of the function tabs are clicked.
- When a new case is initiated, the flow is from left to right. For example, the user begins with the **Case Data** tab, followed by **Deformity Parameters** tab, etc. Tabs that are not appropriate to the next step of the case planning process are grayed out. Once the case is completed, the user can navigate freely between tabs.
- The TL-HEX software is designed for minimal response (wait) time. However, in the event of Internet transmission delays, an "in process" spinner wheel is displayed while the user's PC is waiting for a response from the TL-HEX server (Fig. 38).
- In certain situations (such as a ring size change), recalculation of the strut lengths is required. In these situations, the popup window appears on the screen (Fig. 39).
- In case of temporary loss of Internet connection and/or when done for the day (by logging off), the surgeon should close the Internet Browser, then reopen browser, clear the browser history, open TL-HEX application and login.
- The session will automatically time out after 30 minutes. The surgeon should close the Internet Browser, then reopen browser, clear the browser history, open TL-HEX application and login.



Fig. 38. "In process" spinner.

TL-HEX
TRUELOK HEXAPOD SYSTEM

ORTHOFIX

Home Page Cases Patients Account

Case Data Deformity Parameters **Frame Parameters** Postoperative End of Correction Schedule Prescription Report Checkup

Case Number: Case 4 Case Name: Case four Patient ID: Patient A Side Selection: Left

Select External Supports
 Proximal Support - Ring Type: Full Ring Ring Size: 180mm
 Distal Support - Ring Type: Full Ring Ring Size: 180mm

Mounting Parameters

Reference Ring AP Translation (mm): 0
 Reference Ring ML Translation (mm): 25
 Reference Ring Position (mm): 100
 Second Ring Position (mm): 81

Information
 Calculating Struts...
 Relative to Osteotomy/Fracture Level

Update Views

AP view ML view Axial view

Total	Strut 1 (mm): 243	Strut 2 (mm): 218	Strut 3 (mm): 194	Strut 4 (mm): 186	Strut 5 (mm): 203	Strut 6 (mm): 234
Size	Long	Long	Long	Long	Long	Long
Acute	5	0	34	26	43	0
Gradual	2	20	78	78	78	4

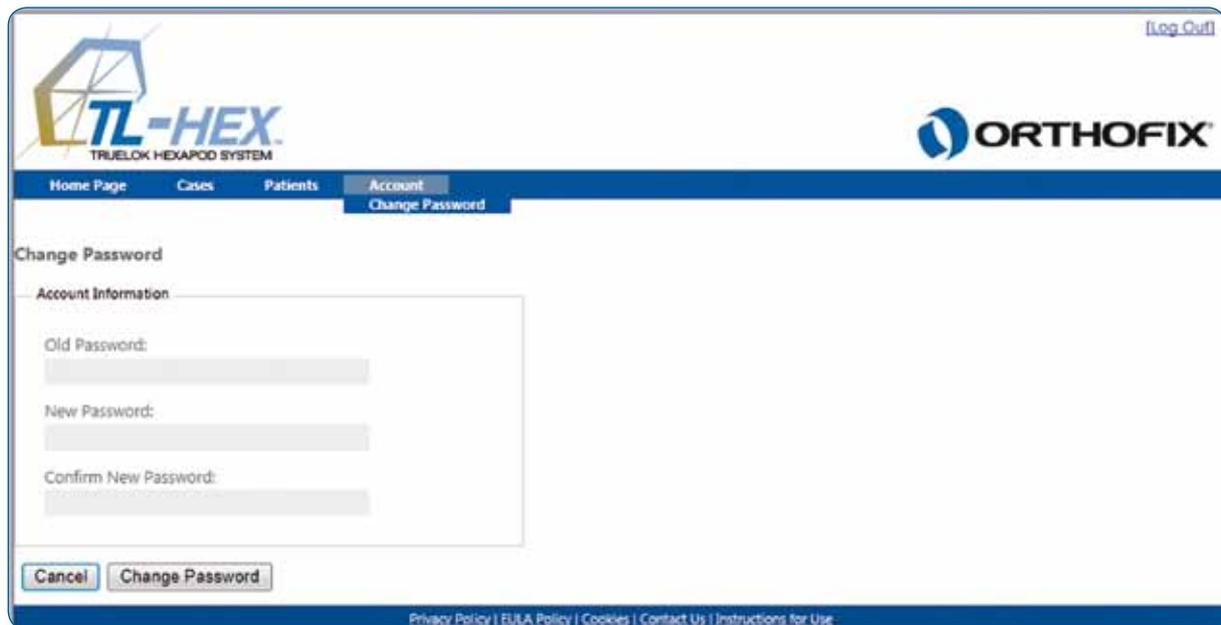
Previous Next

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Fig. 39. Popup window for calculation of strut lengths.

6.1 Change Password

It is recommended that the user change the password during the first login and periodically thereafter. The **Change Password** screen (Fig. 40) appears by clicking on the **Account** menu. Simply enter the current password, followed by entering/confirming the new password, then click **Change Password**. Passwords must be 6 or more characters and is case sensitive.



The screenshot shows the 'Change Password' screen within the TL-HEX software interface. The top navigation bar includes 'Home Page', 'Cases', 'Patients', 'Account', and 'Change Password'. The 'Account' menu is currently selected. The main content area is titled 'Change Password' and contains a form with the following fields: 'Old Password:', 'New Password:', and 'Confirm New Password:'. Below the form are two buttons: 'Cancel' and 'Change Password'. The footer of the screen contains links for 'Privacy Policy', 'EULA Policy', 'Cookies', 'Contact Us', and 'Instructions for Use'. The Orthofix logo is visible in the top right corner.

Fig. 40. Change Password screen.

It is important to remember that the surgeon remains ultimately responsible for the confidentiality of the information entered into the software. One of the ways to ensure confidentiality is to ensure password integrity by changing it at regular intervals and by keeping the password as secure as possible.

Warning: Under the Orthofix Terms of Use (End User License Agreement and Privacy Policy), the surgeon should never enter information that directly identifies a patient. The patient number is intended to be used as an identifying link to the patient within the surgeon's patient management system.

For technical support or information on Software Use please contact the Customer Care: tlhexcustomercare@orthofix.com
For further support contact info and resources refer to www.tlhex.com

Manufactured by:
ORTHOFIX Srl
Via Delle Nazioni 9
37012 Bussolengo (Verona)
Italy

Telephone +39 045 6719000
Fax +39 045 6719380



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