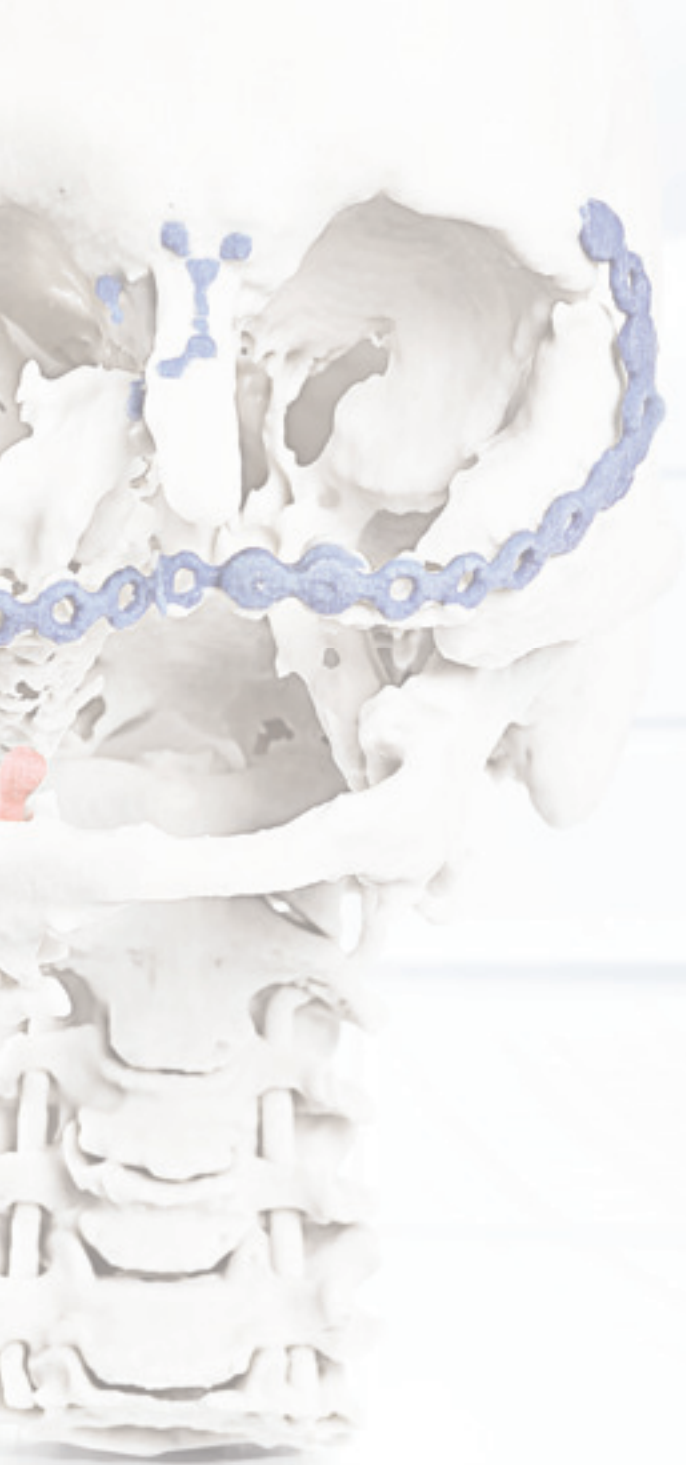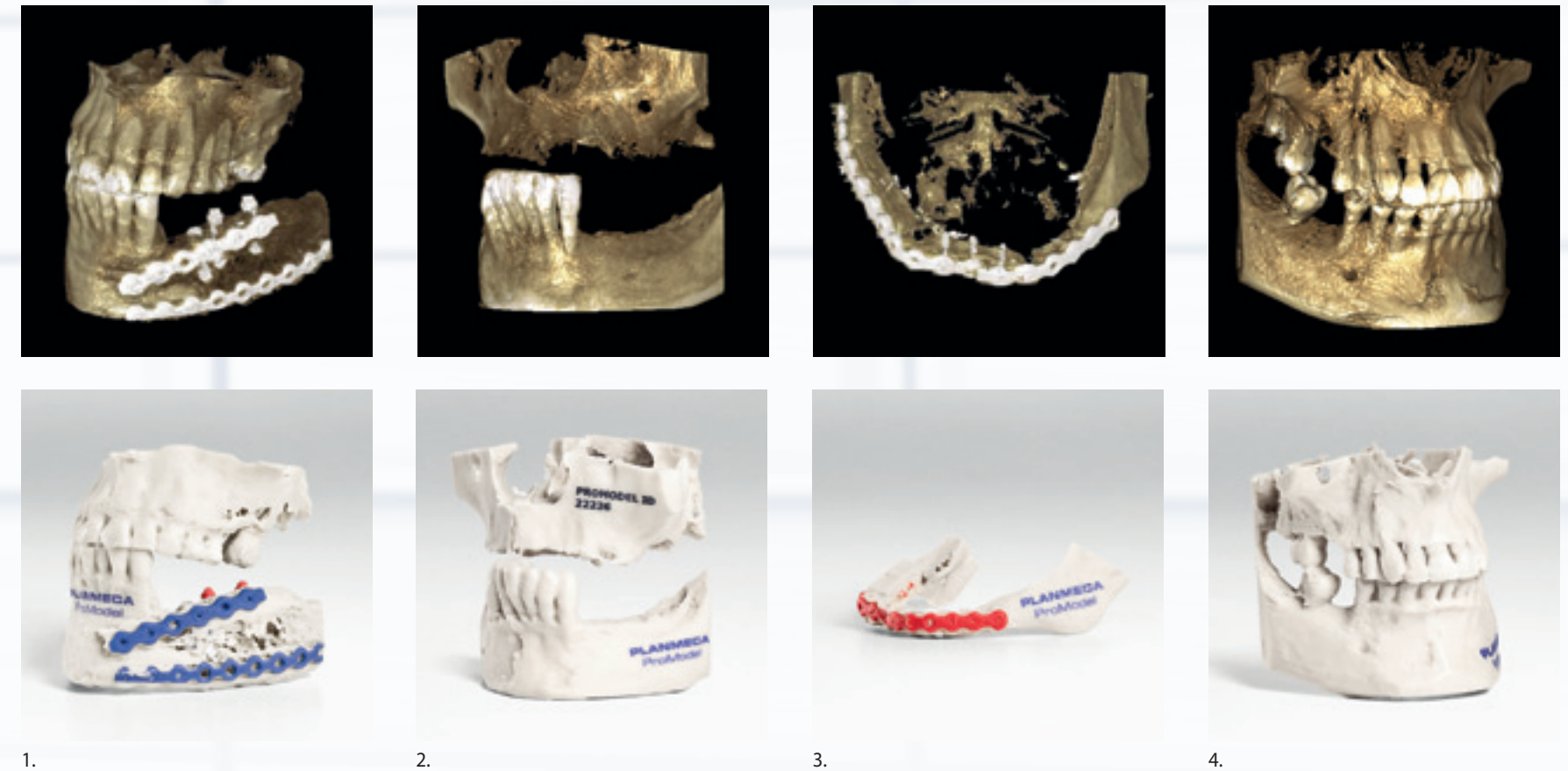**PLANMECA**
ProModel

For true visualisation

Planmeca ProModel is a patient-specific physical model for high-end maxillofacial operations and dental surgery. By reproducing the anatomy of the patient in real-size, Planmeca ProModel adds exceptional value to preoperative planning. The increased understanding of the case before the actual operation makes the workflow straightforward reducing operation time and risks. The model is proven to enhance aesthetic results, decrease complications, save time, and reduce costs.

PLANMECA
ProModel

1.   2.   3.   4.

Planmeca ProModel is highly beneficial for planning advanced implantology. The physical model is an identical replica of the patient's anatomy allowing for the practitioner to familiarise with the case before the actual operation. The model operates as a tool for measuring bone thickness in the area of planned implantation. In addition, the model can be used as a template to create a patient specific drill guide.

The highly detailed model can also feature coloured mandibular nerve to further assist preoperative planning: the nerve is simply drawn onto the patient's 3D data in the Planmeca Romexis software, and Planmeca creates a model with the coloured nerve.

Planmeca ProModel is also available in autoclavable material giving the advantage to create drill guides using the model as a template. The designed guides can be placed directly on the patient.

1. Overgrowth case: Female patient with overgrowth in the left posterior mandible area. In the first surgery the region was cut half. Reconstruction plates and implant screws were coloured in Planmeca ProModel for better visualisation of the post-operative bone growth and for planning of the next surgery.

2. Full maxilla and significant part of left mandible programmed for implantation. Planmeca ProModel was used for planning the exact positions to fit the implants.

3. Bonegraft case: Female patient's mandible after tumour removal surgery. Tumour was located under the tongue. Before the reconstruction surgery Planmeca ProModel was built for bending the titanium plates prior to operation. The actual surgery was carried out as planned.

4. Patient with need for implantation at the right molar area. Planmeca ProModel was used for the visualisation of the region of interest and measuring the amount of bone to ensure a successful implant installation.

Maxillofacial surgery
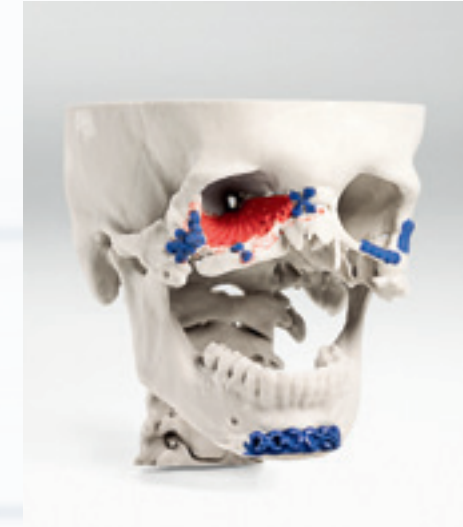
1.

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The finest quality and extreme accuracy of the model ensure that Planmeca ProModel is the number-one choice for preoperative planning of high-end maxillofacial surgery.

Using the model when planning the operation, the workflow will be more straightforward. Most importantly, the outcome of the operation is improved, and the operation time is drastically reduced, meaning better aesthetic results and reduced risks of complications.

The reduced operation time generates significant cost savings and increases capacity. When used as a standard tool for planning demanding maxillofacial surgeries, the model generates significant long-term benefits.

As the model turns the patient anatomy into an actual hand-held replica, it can be used as a demonstration and communication tool not only between the surgical team and the patient, but also among the specialists of maxillofacial surgery. Using the model, it is easier

to explain the scope of the problems and the course of the operation to the patient. The treatment team on the other hand can use the model to discuss the case and the possible treatment options.

The life-span of the model doesn't end with the treatment: it can be used for education purposes, at seminars or in publications.

1. Patient in the postoperative state after extensive tumour removal surgery at maxilla. Planmeca ProModel was used for planning the reconstruction surgery.

2. Stem cell case. Maxilla atrophy due to long-term use of prosthesis. A new maxilla bone was grown inside the patient's back muscle from the patient's stem cells. The surgical team planned the surgery by drawing the operational lines and measuring

the bone using Planmeca ProModel. The model was also used for rehearsing the removal of maxilla and for planning the transplantation of the new maxilla.

3. Patient before forehead reconstruction. Planmeca ProModel was used to measure the amount of bone needed for the skullcap. The required bone was transplanted from the patient's own bone.

4. Patient after first reconstruction surgery. Planmeca ProModel visualises the current state of the patient's anatomy and assists in planning the second phase of the reconstruction by helping in bending reconstruction plates and shaping wax templates.

Planmeca ProModel is available in autoclavable material.

Use colour to identify reconstruction plates and implant screws.

Identify the region of interest.

Available in full colour.

Each model comes with a personal ID.

Colour the nerve.

Planmeca ProModel features high-accuracy information that correspond precisely to the anatomical details of the patient. The model is available in full colour, for easy visualisation of reconstruction plates and implant screws. Using the Planmeca Romexis software, the nerve can be marked in the 3D volume of the mandible to create a model with a coloured mandibular nerve. The autoclavable material extends the use of Planmeca ProModel from pre-operative planning to the actual treatment: the model can be

brought into a sterile area and used as a template for bone graft during the surgery.

Planmeca ProModel requires no additional effort or special imaging protocols, simply a routine 3D exposure. A real-size model can be created from any of the Planmeca ProMax 3D imaging modes. Each model is identified with a personal ID, provided when filling in the order form.

These unique features offer impressive direct benefits. Used as a pre-operative planning tool, the model reduces

operation times by 1–2 hours on average. The model is excellent for measuring distances and bone thickness and for bending the reconstruction plates prior to operation.

Careful pre-operative planning results in better aesthetic results and fewer post-operative complications. Using the model, postoperative intensive care days can be reduced by 1–2 days per patient. The 10-percent cost savings per operation with the reduced intensive care days mean substantial savings combined.
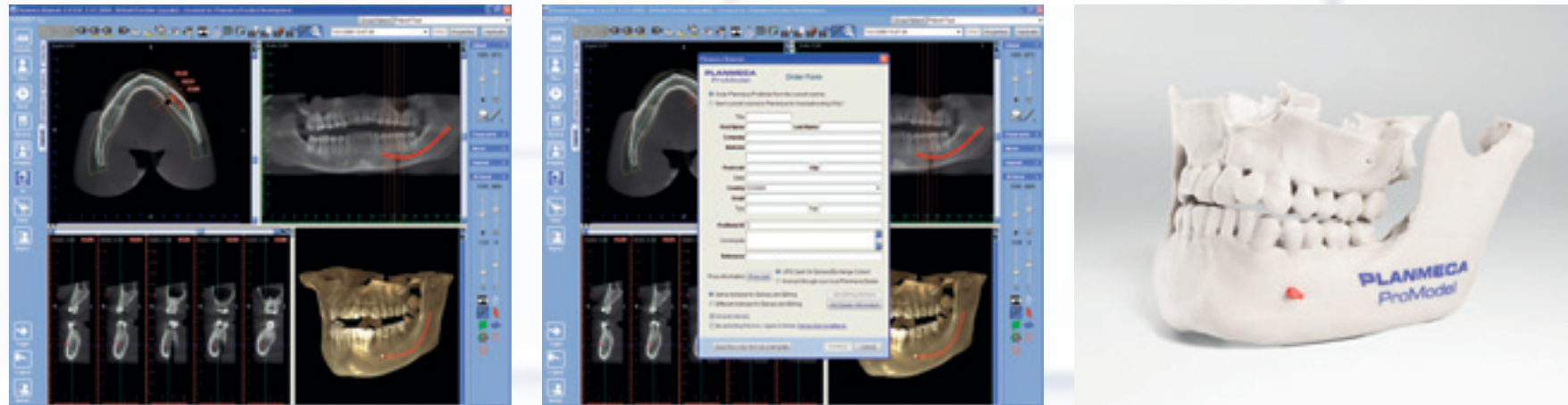
The Planmeca ProModel ordering interface is integrated with the Planmeca Romexis software. Online ordering is made simple; once the desired 3D volume is acquired, all there is to do is to complete the order form in Planmeca Romexis, and the volume is instantly sent to Planmeca's server. To achieve anonymity, all personal information of the patient is removed before any data is transferred. Alternatively, volume and order information can be uploaded directly to FTP-server or burned on a CD or a DVD and mailed to Planmeca.

Planmeca Romexis software

Planmeca Romexis is a complete dental imaging software, including all dental imaging modalities: intraoral, panoramic, cephalometric, 3D imaging, dental tomography as well as intraoral video and still camera imaging. With a complete set of tools for image viewing, enhancement, measurements, and annotations, Planmeca Romexis also improves the diagnostic value of radiographs. Printing, image import and export, and DICOM functionalities are also included.

Planmeca Romexis platform fully integrates digital imaging with the patient's other clinical data. The system provides direct image capture from Planmeca's X-ray equipment, and interfaces with 3rd party devices via TWAIN. Together with Planmeca's X-ray equipment, Planmeca Romexis provides a unique safety feature especially useful for teaching environment: the X-ray image capture is inhibited until the supervisor has approved the student's image capture request.

Planmeca Romexis computer recommendations

	Planmeca Romexis client workstation	Planmeca Romexis server
Processor	2 GHz Core Duo or equivalent	3 GHz Core Duo or equivalent
RAM	4 GB	4 GB
Hard disk space	40 GB	2 x 500 GB (RAID1 mirroring)
Graphics card	ATI or NVIDIA, 128 MB minimum memory	Not required
Monitor	1280 x 1024	1024 x 768
Peripherals	CD R/W or DVD R/W drive	CD R/W or DVD R/W drive
Backup medium	None necessary	DAT or equivalent
Operating system	Windows XP (32 bit) Windows Vista (32 or 64) Windows 7 (32 or 64) Mac OS X	Windows XP Pro (32 bit) Windows 2003 (32 or 64) Windows Vista (32 or 64) Windows 7 (32 or 64)
Other	Java platform (Java Virtual Machine 1.6 or later)	Java platform (Java Virtual Machine 1.6 or later)

The disk space requirements are determined by digital images. Thus the space requirements vary, but a rough estimate is in the order of 1 MB per 2D X-ray image, 7–9 MB per extraoral image, depending on a variety of image specific factors, and 250 MB per 3D image.

It is recommended to use the same computer as an application server and as a database server. If Planmeca Romexis server computer is also used for client activities, the hardware should meet both client and server specifications.

These specifications are recommended minimum requirements. Not meeting them may lead to degraded performance.

DICOM compatibility
• Media Storage – saving images into removable DICOM media
• Print – printing images on film or paper with a DICOM medical printer
• Storage – saving images into DICOM image archive
• Query/ Retrieve – importing digital images from DICOM image archive
• Worklist – importing a patient list from DICOM patient management
• Storage Commitment – confirmation of a successful image storage

Planmeca Oy designs and manufactures a full line of high technology dental equipment, including dental care units, panoramic and intraoral X-ray units, and digital imaging products. Planmeca Oy, the parent company of the Finnish Planmeca Group, is strongly committed to R&D, and is the largest privately held company in the field.

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