



CAOS INTERNATIONAL 2002

2nd Annual Meeting of the INTERNATIONAL SOCIETY FOR COMPUTER ASSISTED ORTHOPAEDIC SURGERY

June 19-22, 2002

Jointly Supported by:

- The International Society for Computer Assisted Orthopaedic Surgery
- The Institute for Computer Assisted Orthopaedic Surgery at The Western Pennsylvania Hospital, Pittsburgh, PA, USA
- The Western Pennsylvania Hospital

Conference Organizer:

- Anthony M. DiGioia, III, MD

CAOS
SURGICAL ACADEMY
June 23, 2002

SWEENEY CONVENTION CENTER
SANTA FE, NEW MEXICO, USA



Conference Description

CAOS International 2002 is the Second Annual Meeting of the International Society for Computer Assisted Surgery.

The Society brings together individuals throughout the world, who, by their contributions and activities both in the area of research and clinical study are interested in the computer based technologies for orthopaedic surgery. Its further purpose is to serve as a forum for the exchange of information from both an investigative and clinical nature.

The Second Annual Scientific Meeting of CAOS International is one of the most authoritative meetings continuing with the well-established format of the past five CAOS Symposia both in Europe and the USA. The program combines didactic sessions with hands-on workshops designed to provide a comprehensive understanding of CAOS techniques and clinical systems in areas such as total joint replacement, trauma surgery, sports medicine, and others. The conference schedule will allow ample time for interaction and discussion between the presenters and their audience.

Conference Objective

Participation in CAOS International 2002 will provide you with the knowledge and skills needed to effectively understand and relate medical robotics, navigational technologies, and computer assisted surgical systems to clinical orthopaedic practice.

Participants will obtain an international perspective on the state of the art as well as future developments and clinical directions. After attending this conference, participants will recognize clinical and technical issues, emerging trends, and develop the basic skills necessary to utilize CAOS techniques in an operating room setting.

Topics

Enabling Technologies for Orthopaedic Surgery

Navigation and Image Guided Surgical Systems
 Robotic Assisted Tools
 Fluoroscopic Navigation
 Hybrid Reality Visualization
 Planners and Simulators
 Tools for Minimally Invasive Surgery

Clinical Applications

Total Joint Replacement
 Arthroscopy and Ligament Reconstruction
 Fracture Reduction and Fixation
 Spinal Instrumentation
 Osteotomies

One-half day CAOS Surgical Academy

A half day "hands-on" workshop is planned for surgeons and operating rooms staff!

On the Sunday immediately following the CAOS International Conference there will be a special optional session for surgeons and OR staff to use and test several navigation and robotic assistive systems in the areas of trauma, total hip and knee replacement, ligament reconstruction and spinal instrumentation. This completely "hands-on" session will permit all participants to perform these procedures using currently available CAOS systems. Space is limited so be sure and register for the academy with your registration of the conference.

Accreditation and Certification

The Western Pennsylvania Hospital is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians.

The Western Pennsylvania Hospital designates this educational activity for up to 24.5 hour(s) in Category 1 credit towards the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

It is the policy of The Western Pennsylvania Hospital Department of Continuing Medical Education to comply with the ACCME Standards for Commercial Support of Continuing Medical Education. All faculty participating in directly sponsored or jointly sponsored programs by The Western Pennsylvania Hospital are required to disclose to the program audience any real or apparent conflict(s) of interest related to the content of their presentation(s). In accordance with the Accreditation Council for Continuing Medical Education requirements on disclosure, information about relationships of presenters with commercial interest (if any) will be included in materials distributed at the time of the conference.

All faculty are also required when discussing any "off-label" use of pharmaceuticals or medical devices, to inform the audience that the product is not labeled for the use under discussion.

Faculty

The faculty of the CAOS International 2002 Conference is comprised of internationally renowned physicians and scientists widely recognized for their clinical and teaching expertise. The open format of the conference provides ample opportunity for personal interaction between faculty and conference participants.

Conference Organizer

Anthony M. DiGioia, III, MD

Institute for Computer Assisted Orthopaedic Surgery at The Western Pennsylvania Hospital, USA

Technical Planning Committee

Andre Bauer, MD

Marbella High Care S.A., SPAIN

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Stiftung CAESAR, GERMANY

S. David Stulberg, MD

Northwestern University Medical School, USA

Scientific Coordinator

Branislav Jaramaz, PhD

The Western Pennsylvania Hospital, USA

Keynote Address

Introduction to New Clinical Applications and New Approaches

Ruben C. Berumen, CEO

GE OEC Medical Systems, Inc., USA

Presenters

Amin, Devin V., PhD	Carnegie Mellon University, Pittsburgh, PA, USA
Arand, Markus, MD	University of Ulm, Ulm, GERMANY
Athwal, George S., PhD	Queen's University, Kingston, Ontario, CANADA
Bächler, Richard	University of Bern, Bern, SWITZERLAND
Bargar, William L., MD	Sutter General Hospital, Sacramento, CA, USA
Bauer, André, MD	Marbella High Care, Nueva Andalucia, SPAIN
Beck, Thomas M.	University Hospital of Basel, Basel, SWITZERLAND
Birkfelner, Wolfgang, PhD	CARCAS-Group, Basel, SWITZERLAND
Bodammer, Antje	Charité Berlin, Berlin, GERMANY
Brendel, Bernhard	Ruhr-University Bochum, Bochum, GERMANY
Burton, Ma, MSc	Queen's University, Kingston, Ontario, CANADA
Cassenti, Laura, MS	Carnegie Mellon University, Pittsburgh, PA, USA
Chen, Edward, MD	University of Heidelberg, Heidelberg, GERMANY
Clemens, Ulrich, MD	St. Josef Stift Sendenhorst, Sendenhorst, GERMANY
Cobb, Justin P., MD	University College London Hospitals, London, UK
Conditt, Michael A., PhD	Institute of Orthopedic Research and Education, Houston, TX, USA
Confaloneri, Norberto, MD	Istituti Clinici di Perfezionamento, Milano, ITALY
Croitoru, Haniel, MSc	Cedara Software Corp., Mississauga, Ontario, CANADA
de Siebenthal, Julien, MSc	University of Bern, Bern, SWITZERLAND
de Steiger, Richard	Royal Melbourne Hospital, Melbourne, AUSTRALIA
Decking, Ralf, MD	University of Ulm, Ulm, GERMANY
DiGioia, Anthony M., III, MD	The Western Pennsylvania Hospital, Pittsburgh, PA, USA
Duchow, Jochen	University of Saarland, Saarland, GERMANY
Edwards, Philip J., MD	CISG, KCL, London, UK
Eichhorn, Jürgen, MD	Orthopädisch-Sporttraumatologische Praxis, Straubing, GERMANY
Ellis, Randy, PhD	Queen's University, Kingston, Ontario, CANADA
Euler, Ekkehard, MD	University of Munich, Munich, GERMANY
Friedrich, Dirk, Dr.-Ing.	Aesculap AG & Co. KG, Tuttlingen, GERMANY
Fritsch, Ekkehard W., MD	University of Saarland, Saarland, GERMANY
Gautheron, Thierry	Centre Hospitalier- Moutiers, Moutiers, FRANCE
Gebhard, Florian, MD	University of Ulm, Ulm, GERMANY
Glossop, Neil D., PhD	Traxtal Technologies LLC, Bellaire, TX, USA
Grieshammer, Thomas, MD	Klinikum Neubrandenburg, Neubrandenburg, GERMANY
Grützner, Paul A., MD	University of Heidelberg, Ludwigshafen, GERMANY
Harris, Simon J., PhD	Imperial College of Science, Technology and Medicine, London, UK
Heining, Sandro-Michael, MD	University of Munich, Munich, GERMANY
Hinsche, Andreas F., MD	St. James's University Berlin, Leeds, UK
Hüfner, Tobias, MD	Hannover Medical School, Hannover, GERMANY
Hung, Shuo-Suei, MD	Chang Gung Memorial Hospital, Kweishan, Taoyuan, TAIWAN
Ioppolo, James L.	Maurice E. Muller Institute for Biomechanics, Bern, SWITZERLAND
Jakopec, Matjaz, PhD	Imperial College of Science, Technology and Medicine, London, UK
Jenny, Jean-Yves, MD	Center for Orthopedic and Trauma Surgery of Strasbourg, Illkirch, FRANCE
Joskowicz, Leo, PhD	Hebrew University of Jerusalem, Jerusalem, ISRAEL
Kahler, David M., MD	University of Virginia, Charlottesville, VA, USA
Kawakami, Hideo, MD	Osaka University Graduate School of Medicine, Suita, Osaka, JAPAN
Keppler, Peter	University of Ulm, Ulm, GERMANY
Kettrukat, Marco	Auguste-Viktoria-Klinik Bad Oeynhausen, Bad Oeynhausen, GERMANY
Koga, Yoshio, MD, PhD	Nilgata Kobari Hospital, Nilgata, JAPAN
König, Benjamin, MD	Charité Berlin, Berlin, GERMANY
Kowal, Jens, M.E.	Mueller Institute for Biomechanics, Bern, SWITZERLAND
Kubiak-Langer, Monika	University of Bern, Bern, SWITZERLAND
Kunz, Manuela	University of Bern, Bern, SWITZERLAND
Kurta, Ilona C., FRCS	North Staffordshire Research Foundation, Staffordsire, UK
LaBarca, Richard S., MS	Carnegie Mellon University, Pittsburgh, PA, USA

Laine, Timo, MD	ORTON Orthopaedic Hospital, Helsinki, FINLAND
Langlotz, Frank, PhD	University of Bern, Bern, SWITZERLAND
Mai, Sabine, MD	Orthopedic Clinic Kassel, Kassel, GERMANY
Mattes, Thomas, MD	Orthopedic University Hospital, Ulm, GERMANY
Mayman, David J., MD	Queen's University, Kingston, Ontario, CANADA
Ménétrey, Jacques, MD	University Hospital of Geneva, Geneva, SWITZERLAND
Merloz, Philippe, MD, PhD	University of Grenoble, Grenoble, FRANCE
Mitschke, Matthias, Dipl.Ing.	Siemens Medical Solutions, Erlangen, GERMANY
Moody, James E., MS	The Western Pennsylvania Hospital, Pittsburgh, PA, USA
Mueller-Wittig, Wolfgang, PhD	Centre for Advanced Media Technology-CAMTech, SINGAPORE
Murphy, Michael, PhD	Louisiana State University, Baton Rouge, LA, USA
Murphy, Stephen, MD	Boston Orthopedic Group, Brookline, MA, USA
Nabeyama, Ryotaro, MD	Kyushu University, Fukuoka, JAPAN
Nikou, Constantinos, MS	The Western Pennsylvania Hospital, Pittsburgh, PA, USA
Nizard, Rémy, MD, PhD	Lariboisière Hospital, Paris, FRANCE
Nofrini, Laura	Istituti Ortopedici Rizzoli, Bologna, ITALY
Nolte, Lutz-P., PhD	University of Bern, Bern, SWITZERLAND
Ohnsorge, Jörg, A.K., MD	University Clinic Aachen, Aachen, GERMANY
Pashmineh-Azar, Alireza, MD	Phillips-University of Marburg, Marburg, GERMANY
Phillips, Matthew J., MD	State University of New York at Buffalo, Buffalo, NY, USA
Pipino, Francesco, MD	Genoa University, Genova, ITALY
Plaskos, Christopher, MASc	University of British Columbia, Vancouver, British Columbia, CANADA
Pojedinec, John, MD	Private Practice, Hackensack, NJ, USA
Portheine, Frank, Dipl.Ing.	University Clinic Aachen, Aachen, GERMANY
Prasad, Srinivas K., MD	Johns Hopkins University, Owings Mills, MD, USA
Prymka, Marcel, MD	University of Kiel, Kiel, GERMANY
Radermacher, Klaus, PhD	University Clinic Aachen, Aachen, GERMANY
Radmer, Sebastian, MD	Free University of Berlin, Berlin, GERMANY
Rampersaud, Y. Raja, MD	University of Toronto, Toronto, Ontario, CANADA
Ritschl, Peter	Orthopädisches Krankenhaus Gersthof, Vienna, AUSTRIA
Rodriguez y Baena, Ferdinando M., MEng	Imperial College, London, UK
Saragaglia, Dominique, MD, CHU	de Grenoble, Echirolles, FRANCE
Sati, Marwan, PhD	Cedara Software Corp., Mississauga, Ontario, CANADA
Schep, Niels W.L., MD	University Medical Center Utrecht, Utrecht, THE NETHERLANDS
Schmucki, Daniel	AO Development Institute, Davos, SWITZERLAND
Segers, Michiel J.M., MD	Vrije Universiteit Medical Center, Amsterdam, THE NETHERLANDS
Shoham, Moshe, PhD	Israel Institute of Technology, Haifa, ISRAEL
Steffen, Reinhard	Marienkrankenhaus Kaiserswerth, Dusseldorf, GERMANY
Stindel, Eric, MD	Universitaire de Brest, Brest, FRANCE
Stockheim, Martin, MD	Ruhr-University Bochum, Bochum, GERMANY
Stoeckle, Ulrich, MD	Humboldt University Berlin, Berlin, GERMANY
Stulberg, S. David, MD	Northwestern University, Chicago, IL, USA
Sugano, Nobuhiko, MD	Osaka University Medical School, Suita, Osaka, JAPAN
Suhm, Norbert, MD	Association for the Study of Internal Fixation, Davos, SWITZERLAND
Swank, Michael L., MD	Cincinnati Orthopaedic Research Institute, Cincinnati, OH, USA
Tamura, Yuichi, MD	Osaka University, Suita, Osaka, JAPAN
Tarte, Ségolène	University of Bern, Bern, SWITZERLAND
Tatsumi, Ichiroh, MD	Osaka City University, Osaka, JAPAN
Taylor, Russell, PhD	Johns Hopkins University, Baltimore, MD, USA
Torres, Roque, PhD	Polytechnic University of Cartagena, Cartagena, SPAIN
van de Kraats, Everine, MSc	University Medical Centre Utrecht, Utrecht, THE NETHERLANDS
Wendl, Klaus	BG-Unfallklinik, Ludwigshafen, GERMANY
Widmer, Karl-Heinz, MD Dipl.Ing.	Kantonsspital Bruderholz, Bruderholz, SWITZERLAND
Wiese, Matthias	Ruhr-University-Bochum, Bochum, GERMANY
Zheng, Guoyan	University of Bern, Bern, SWITZERLAND

Schedule at a Glance

Wednesday
June 19, 2002

Thursday
June 20, 2002

Friday
June 21, 2002

	7:00AM Registration	7:00AM Registration
	8:00AM Introduction	8:00AM Session 6 - TKA
	8:10AM Session 1 - TKA	9:20AM Session 7 - Spine
	9:10AM Session 2 - Spine	10:10AM Poster Session & Exhibition Inspection
	10:00AM Poster Session & Exhibition Inspection	10:40AM Keynote Presentation
	10:30AM Session 3 - Accuracy	11:00AM Session 8 - New Applications
	11:30AM Poster Session & Exhibition Inspection (box lunch)	12:30PM Poster Session & Exhibition Inspection (box lunch)
	12:40PM Panel Discussion	1:30PM Session 9 - Registration
	1:30PM Session 4 - Emerging Technologies	2:30PM Session 10 - Special Poster Session Part 2
	2:30PM Session 5 - Special Poster Session Part 1	2:55PM Poster Session & Exhibition Inspection
	2:55PM Poster Session & Exhibition Inspection	3:30PM Workshop Series 1 (continued)
3:00 - 6:00PM Registration	3:30PM Workshop Series 1	5:15PM General Assembly
6:30 - 9:30PM Welcome Reception	5:10PM Adjourn for the day	8:00 - 11:00PM Conference Banquet

Saturday
June 22, 2002

7:00AM
Registration

8:00AM
Session 11 - THA

9:20AM
Session 12 - Imaging

10:20AM
Poster Session &
Exhibition Inspection

10:50AM
Workshop Series 2

12:30PM
Poster Session &
Exhibition Inspection (box lunch)

1:30PM
Workshop Series 2 (continued)

3:15PM
Conference Adjourns

4:45PM
Buses depart for
Movie Studio Ranch

5:15PM
Movie Studio Ranch
BBQ & Awards Ceremony
(transportation provided)

Sunday
June 23, 2002

8:00AM
Registration

9:00AM
Surgical Academy

12:00PM
Surgical Academy Adjourns



Grants & Support

The Institute for Computer Assisted Orthopaedic Surgery and The Department of Continuing Medical Education at The Western Pennsylvania Hospital and The International Society for Computer Assisted Orthopaedic Surgery gratefully acknowledge the following institutions and companies for their Educational Grants in support of this conference.

AESCULAP / B.BRAUN

BrainLAB Inc.

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KINAMED, Inc.

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Medtronic Surgical Navigation Technologies

MERITS of Pittsburgh

Northern Digital Inc.

PI Precision Implants AG

Smith & Nephew, Inc.

Sulzer Orthopedics Ltd. (Barr, Switzerland)

West Penn Allegheny Health System

Zimmer, Inc.

Industrial Exhibition

Companies interested in exhibiting their latest diagnostic equipment, surgical guidance systems, prosthetic devices, computer hardware, image display and archive systems, image processing software, books, journals, etc. are invited to exhibit. The conference provides an excellent opportunity for companies to promote their products, and to establish contacts with those who are the world's leading opinion makers in medical image computing, computer assisted intervention, surgical guidance and robotics.

If your company has something to offer in the latest state-of-the-art equipment, techniques or systems for the individual hands-on demonstration workshop session, we would definitely like to explore your involvement in this meeting. This conference offers an intimate program schedule and open workshop format of this workshop as well as ample opportunity for interaction between faculty, participants and exhibitors.

Contact Us

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Program Schedule

Wednesday, June 19, 2002

3:00 p.m. -
6:00 p.m.

Registration (Sweeney Conference Center)

6:30 p.m. -
9:30 p.m.

Welcome Reception Open House (Inn at Loretto)

Thursday, June 20, 2002

7:00 a.m.

Registration and Continental Breakfast

8:00 a.m.

Introduction

SESSION 1

TKA

Session Chairs - Rudan, J. and Stulberg, S.D.

8:10 a.m.

Computer-Assisted Total Knee Replacement: Results of the First Thirty Cases using the Stryker Navigation System

¹Phillips, M. J., ¹Krackow, K.A., ²Bayers-Thering, M.

¹State University of New York at Buffalo, USA and ²Buffalo General Hospital, USA

8:20 a.m.

Computer Assisted Total Knee Arthroplasty Implantation: To Release or not to Release?

Jenny, J.-Y. and Boeri, C.

Center for Orthopedic and Trauma Surgery of Strasbourg, FRANCE

8:30 a.m.

Computerized Analysis of Surgical Skills in TKA using a Surgical Navigation System

¹Conditt, M.A., ²Noble, P.C., ¹Thompson, M.T., ¹Moy, G.J., ¹Ismaily, S.K., and ²Mathis, K.B.

¹Institute of Orthopedic Research and Education, USA and ²Baylor College of Medicine, USA

8:40 a.m.

First Clinical Trials of a "Hands-On" Active Constraint Robot

¹Cobb, J., ²Harris, S.J., ¹Jakopec, M., ²Rodriguez y Baena, F.,

²Henckel, J., ¹Gomes, P., and ²Davies, B.L.

¹University College London Hospitals, UK and ²Imperial College, UK

8:50 a.m.

Outcome of Computer-Navigated Total Knee Arthroplasty.

One Year Follow-Up of a Prospective Randomized Trail

¹Decking, R., ¹Markmann, Y., ¹Fuchs, J., ²Scharf, H.-P., and ¹Puhl, W.

¹University of Ulm, GERMANY and ²Mannheim University, GERMANY

9:00 a.m.

DISCUSSION

SESSION 2

Spine

Session Chairs -Merloz, P. and Radermacher, K.

9:10 a.m.

A New Approach to Combine Visualization and Simulation for Preoperative Planning of Pedicle Screw Insertion

¹Mueller-Wittig, W., ²Bockholt, U., ¹Voss, G., and ³Boerner, M.

¹Centre for Advanced Media Technology, SINGAPORE,

²Fraunhofer-IGD, GERMANY, and ³BG Unfallklinik, GERMANY

9:20 a.m.	Virtual Fluoroscopy for Percutaneous Placement of Pedicle Screws and Rod Insertion with the Sextant Rod Insertion System - Early Experiences from the First 20 Clinical Cases Fritsch, E.W., Gödde, S., Seil, R., and Duchow, J. <i>University of Saarland, GERMANY</i>
9:30 a.m.	Bone-Mounted Miniature Robot for Surgical Spinal Procedures ^{1,2} Shoham, M., ² Burman, M., ² Zehavi, E., ³ Joskowicz, L., ¹ Batkilim, E., and ¹ Kunicher, Y. ¹ Israel Institute of Technology, ISRAEL, ² Masor Robotics Ltd., ISRAEL, and ³ Hebrew University of Jerusalem, ISRAEL
9:40 a.m.	Pedicle Screw Insertion with and without Computer Assistance Two-Year Clinical Results of a Randomized Controlled Study in 100 Patients Laine, T., Lund, T., Ylikoski, M., and Schlenzka, D. <i>ORTON Orthopaedic Hospital, FINLAND</i>
9:50 a.m.	DISCUSSION
10:00 a.m.	Poster Session and Exhibit Inspection
SESSION 3	Accuracy Session Chairs - Nolte, L.-P. and Foley, K.
10:30 a.m.	The Center of the Ankle in CT Less Based Navigation System What is Really Important to Detect? ¹ Stindel, E., ² Gyl, D., ³ Briard, J.L., ⁴ Plaweski, S., and ¹ Lefevre, C. ¹ Hôpital de la Cavale Blanche, FRANCE, ² Laboratoire de Traitement de l'Information Médicale, FRANCE, ³ Clinique du cèdre, FRANCE, ⁴ Hôpital Michallon, FRANCE
10:40 a.m.	Detection of the Center of the Hip in CT Less Based System for TKA Navigational Guidance: An Evaluation Study of the Accuracy and Reproducibility of the Surgetic's Algorithm ¹ Stindel, E., ² Gyl, D., ³ Briard, J.L., ⁴ Merloz, P., ¹ Dubrana, F., and ¹ Lefevre, C. ¹ Hôpital de la Cavale Blanche, FRANCE, ² Laboratoire de Traitement de l'Information Médicale, FRANCE, ³ Clinique du cèdre, FRANCE, and ⁴ Hôpital Michallon, FRANCE
10:50 a.m.	Estimation of Accuracy in Ankle Center Location for Tibial Mechanical Axis Identification using Computer Assisted Surgery Systems ¹ Nofrini, L., ² Ślomożykowski, M., ¹ Iacono, F., ¹ Zaffagnini, S., and ¹ Marcacci, M. ¹ Istituti Ortopedici Rizzoli, ITALY and ² DePuy International Ltd, UK
11:00 a.m.	Accurate Measurement of Hip and Knee Prosthesis Placement from Postoperative X-Rays ¹ Edwards, P.J., ¹ Penney, G.P., ² Ślomożykowski, M., and ¹ Hawkes, D.J. ¹ King's College London, UK and ² DePuy International Ltd., UK
11:10 a.m.	Is Affine Registration Sufficiently Accurate for Image-Guided Surgery? Burton, M., Rudan, J., and Ellis, R. <i>Queen's University, CANADA</i>

11:20 a.m.

DISCUSSION

11:30 a.m.

Business Meeting, Poster Session and Exhibit Inspection (Box Lunch)

12:40 p.m.

PANEL DISCUSSION**What is the Role of CAOS in Orthopaedic Surgery?**

Moderators DiGioia, A.M., III and Nolte, L.-P.

SESSION 4**Emerging Technologies**

Session Chairs - Langlotz, F. and Kahler, D.

1:30 p.m.

Computer Aided Pedicle Screw Placement using a Novel Laser Guidance System¹Tamura, Y., ¹Sugano, N., ¹Sasama, T., ¹Sato, Y., ²Yonenobu, K.,¹Tamura, S., ¹Yoshikawa, H., and ¹Ochi, T.¹Osaka University Graduate School of Medicine, JAPAN and²Osaka-Minami National Hospital, JAPAN

1:40 p.m.

CT-Image based Planning and Navigation in TKR using Ligament Modeling and Individual Templates¹Portheine, F., ¹Ohnsorge, J.A.K., ²Froemel, M., and ¹Radermacher, K.¹University Clinic Aachen, GERMANY and ²Maingau Hospital Frankfurt, GERMANY

1:50 p.m.

A See-Through Head-Mounted Display for Computer-Aided Surgery¹Birkfellner, W., ²Figl, M., and ²Bergmann, H.¹CARCAS-Group, SWITZERLAND and ²Vienna General Hospital, AUSTRIA

2:00 p.m.

Image Guidance without Images: Deformable Transformations for Surgical Guidance

Ellis, R., Athwal, G., and Rudan, J.

Queen's University, CANADA

2:10 p.m.

Needle Tracking using the Aurora Magnetic Position Sensor¹Glossop, N.D., ²Cleary, K., ³Kull, L., and ²Banovac, F.¹Traxtal Technologies LLC, USA, ²Georgetown University Medical Center, USA, and³Traxtal Technologies Inc., CANADA

2:20 p.m.

DISCUSSION**SESSION 5****Special Poster Session, Part 1**

Session Chair - Pichora, D.R.

2:30 p.m.

Robot-Guided Long Bone Intramedullary Distal Locking: Concept and Preliminary Results¹Joskowicz, L., ²Milgrom, C., ^{3,4}Shoham, M., ¹Yaniv, Z., and ²Simkin, A.¹Hebrew University of Jerusalem, ISRAEL, ²Hadassah University Hospital, ISRAEL,³Technion, ISRAEL, and ⁴Masor Robotics Ltd., ISRAEL

2:35 p.m.

Non-Invasive MR to 3D Rotational X-Ray Registration of Vertebral Bodies^{1,2}van de Kraats, E.B., ^{1,2}van Walsum, Th., ¹Verlaan, J.-J., and ^{1,2}Niessen, W.J.¹University Medical Centre Utrecht, THE NETHERLANDS and²Image Sciences Institute, THE NETHERLANDS

2:40 p.m.	Anatomical Registration Implementation and Results for a “Hands-On” Robotic Knee Surgery System ¹ Rodriguez y Baena, F.M., ¹ Davies, B.L., ¹ Jakopec, M., ¹ Harris, S.J., ¹ Gomes, P.S.F., and ² Cobb, J. ¹ Imperial College, UK and ² University College London Hospitals Trust, UK
2:45 p.m.	Minimally Invasive Registration Techniques for Surgical Navigation using Intraoperative Ultrasound ¹ Amin, D.V., ¹ Kanade, T., ² DiGioia, A.M., III, ² Jaramaz, B., ² Moody, J.E., ² Nikou, C., ¹ LaBarca, R.S., and ² Levison, T.J. ¹ Carnegie Mellon University, USA and ² The Western Pennsylvania Hospital, USA
2:50 p.m.	Computer Assisted Fracture Reduction: A Novel Method for Analysis of Accuracy ¹ Geerling, J., ¹ Hüfner, T., ¹ Citak, M., ¹ Richter, M., ¹ Gössling, T., ² Pohlemann, T., ³ Tarte, S., and ¹ Krettek, C. ¹ Hannover Medical School, GERMANY, ² University of Saarland, GERMANY, and ³ University of Bern, SWITZERLAND
2:55 p.m.	Poster Session and Exhibit Inspection
3:30 p.m.	Workshop Series I (Workshops 1, 3, 5, 7, 9, 11-see page 24 for listing)
3:30 p.m.	Rotation A
4:05 p.m.	Rotation B
4:40 p.m.	Rotation C
5:10 p.m.	Adjourn for the Day

Friday, June 21, 2002

7:00 a.m.	Registration and Continental Breakfast
SESSION 6	TKA Session Chairs - Krackow, K. and Marcacci, M.
8:00 a.m.	Mechanical Leg Axis Determination for Knee Navigation: Accuracy Analysis based on Clinical Data ¹ Friedrich, D., ² Leitner, F., and ¹ Kozak, J. ¹ Aesculap AG & Co. KG, GERMANY and ² Aesculap S.A., FRANCE
8:10 a.m.	Our Experiences with Robot Assisted Surgery in Comparison with Navigation and Manual Technique in Total Knee Arthroplasty Mai, S., Lörke, C., and Siebert, W. Orthopedic Clinic Kassel, GERMANY
8:20 a.m.	Revision Total Knee Arthroplasty using a Navigation System Radmer, S., Wolke, B., and Sparman, M. Immanuel Hospital, Academic Teaching Hospital, Free University of Berlin, GERMANY
8:30 a.m.	DISCUSSION

8:40 a.m.

Intra-Operative User Interface of a “Hands-On” Surgical Robot¹Jakopec, M., ¹Rodriguez y Baena, F.M., ¹Harris, S.J.,¹Gomes, M.P.S.F., ¹Davies, B.L., and ²Cobb, J.¹Imperial College, UK and ²University College London Hospitals Trust, UK

8:50 a.m.

Intraoperative Feedback of Patello-Femoral Joint Alignment during Total Knee Arthroplasty¹Marx, A., ¹Kunz, M., ²Bernsmann, K., ¹Liang, J., and ¹Nolte, L.-P.¹University of Bern, SWITZERLAND and ²Girardet Clinic, GERMANY

9:00 a.m.

Surgetics: A CT Less Based Navigation System for TKA using Morphological Informations without Preoperative Data, Principles and Preliminary Clinical Results¹Stindel, E., ²Briard, J.L., ³Merloz, P., ³Plaweski, S., ¹Dubrana, F., and ¹Lefevre, C.¹Hôpital de la Cavale Blanche, FRANCE, ²Clinique du cèdre, FRANCE, and³Hôpital Michallon, FRANCE

9:10 a.m.

DISCUSSION**SESSION 7****Spine**

Session Chairs - Schlenzka, D. and Cinquin, P.

9:20 a.m.

Virtual Fluoroscopy for Pedicle Screw Insertion: A Clinical Study¹Merloz, P., ²Huberson, C., ¹Tonetti, J., ¹Eid, A., ¹Vouaillat, H.,¹Anders, J., ¹Blendea, S., ¹Martinez, T., and ¹Plaweski, S.¹University Department of Orthopaedic Surgery Grenoble, FRANCE and²Joseph Fourier University Grenoble, FRANCE

9:30 a.m.

Fluoroscopy-Based Computer Assisted Navigation for Limited Invasive Corpectomy and Anterior Stabilization at the Thoracolumbar Junction

Segers, M.J.M., Bakker, F.C., Patka, P., Manoliu, R.A., Haarman, H.J.T.M.

Vrije Universiteit Medical Center, THE NETHERLANDS

9:40 a.m.

Clinical Accuracy of Fluoroscopic Computer-Assisted Pedicle Screw Placement - A Prospective CT Analysis

Rampersaud, Y.R. and Pik, J.

Toronto Western Hospital, CANADA

9:50 a.m.

Registration of 3D CT- and Ultrasound-Datasets of the Spine using Bone Structures¹Brendel, B., ¹Winter, S., ²Rick, A., ¹Stockheim, M., and ¹Ermert, H.¹Ruhr-University Bochum, GERMANY and ²ZN Vision Technologies AG, GERMANY

10:00 a.m.

DISCUSSION

10:10 a.m.

Poster Session and Exhibit Inspection

10:40 a.m.

Keynote Speaker**“Introduction to New Clinical Applications and New Approaches”**

Ruben C. Berumen

GE OEC Medical Systems Inc., USA

SESSION 8**New Applications**

Session Chairs - Taylor, R. and Pojedinec, J.

11:00 a.m.

Is CT-Based Navigation Suitable for Total Elbow Arthroplasty?¹Langlotz, F., ²Herren, D., ²Simmen, B., and ²Baumgartner, W.¹University of Bern, SWITZERLAND and ²Schulthess-Clinic, SWITZERLAND

11:10 a.m.	Fluoroscopic Navigation in the Treatment of Osteochondrosis Dissecans of the Talus ¹ Ohnsorge, J.A.K., ² Radermacher, K., ¹ Wildberger, J., ¹ Prescher, A. and ¹ Siebert, C.H. ¹ University Clinic Aachen, GERMANY and ² Helmholtz-Institut for Biomedical Engineering, GERMANY
11:20 a.m.	Planning and Performing the Ilizarov Technique with the Taylor Spatial Frame Iyun, O., Borschneck, D., and Ellis, R. Queen's University, CANADA
11:30 a.m.	Freehand Navigation for Arthroscopy Assisted Retrograde Drilling Procedure ¹ Marx, A., ¹ Kunz, M., ² Sobau, C., ¹ Beutler, T., ² Ellermann, A., and ¹ Nolte, L.-P. ¹ University of Bern, SWITZERLAND and ² Arcus Sports Clinic, GERMANY
11:40 a.m.	DISCUSSION
11:50 a.m.	Outcomes of Computer Assisted Distal Radius Osteotomy Athwal, G., Pichora, D., Ellis, R., and Small, C. Queen's University, CANADA
12:00 p.m.	Closed Reduction and Percutaneous Internal Fixation of the High Anterior Column Acetabular Fracture Kahler, D.M. and Crowl, A.C. University of Virginia, USA
12:10 p.m.	Computer Enhanced Periacetabular Osteotomy: A New Technique Mayman, D., Ellis, R., Yach, J., and Rudan, J. Queen's University, CANADA
12:20 p.m.	DISCUSSION
12:30 p.m.	Poster Session and Exhibit Inspection (Box Lunch)
SESSION 9	Registration Session Chairs - Lavalley, S. and Cobb, J.P.
1:30 p.m.	Estimating Registration Accuracy using a Probability-Based Approach Bächler, R., Nemec, B., Bunke, H., and Nolte, L.-P. University of Bern, SWITZERLAND
1:40 p.m.	Evaluating Accuracy and the Effect of Data Quantity on Surface-Based Registration of the Hip and Knee ¹ Davidson, D., ² Nikou, C., ¹ LaBarca, R. S., ² Jaramaz, B., and ¹ DiGioia, A.M., III ¹ Carnegie Mellon University, USA and ² The Western Pennsylvania Hospital, USA
1:50 p.m.	Inherent Registration of Mobile 3D Fluoroscopy for Surgical Navigation ¹ Wälti, H., ² Grützner, P.A., ³ Euler, E., and ¹ Nolte, L.-P. ¹ University of Bern, SWITZERLAND, ² University of Heidelberg, GERMANY, and ³ University of Munich, GERMANY
2:00 p.m.	Deformable Registration between a Statistical Bone Density Atlas and X-Ray Images Yao, J. and Taylor, R. Johns Hopkins University, USA

2:10 p.m.

The Iterative Sampled Image Registration Method: Direct Registration of Intraoperative 3D Points to Preoperative CT for Image Guided Surgery¹Amin, D.V., ¹LaBarca, R.S., ¹Kanade, T., ²DiGioia, A.M., III,²Jaramaz, B., ²Nikou, C., ²Moody, J.E., and ²Levison, T.J.¹Carnegie Mellon University, USA and ²The Western Pennsylvania Hospital, USA

2:20 p.m.

DISCUSSION**SESSION 10****Special Poster Session Part 2**

Session Chair - Joskowicz, L.

2:30 p.m.

The Computer Navigation System in TKA Three Years Experience with Orthopilot

Confalonieri, N., Cerea, P., Motavalli, K., and Manzotti, A.

Istituti Clinici di Perfezionamento (CTO), ITALY

2:35 p.m.

Experience with a Hybrid CT-Free Navigation System for Acetabular Cup Placement in Clinical Routine¹Grützner, P.A., ¹Vock, B., ²Langlotz, U., ²Wälti, H.,²Rose, E., ¹Korber, J., ²Nolte, L.-P., and ¹Wentzensen, A.¹University of Heidelberg, GERMANY and ²University of Bern, SWITZERLAND

2:40 p.m.

Computer Assisted Hip-Cup Placement vs. Conventional Free-Hand Hip-Cup Placement¹Stockheim, M., ²Michaelis, U., ²Krödel, A., ³Steffen, R., ³Eppe, ¹Kuehle, P.,¹Rubenthaler, F., ¹Wiese, M., and ¹Haaker, R.¹Ruhr-University Bochum, GERMANY, ²Alfried Krupp Hospital, GERMANY, and³Marien-Hospital, GERMANY

2:45 p.m.

Combined C-Arm and Laser Projection Prototype Device¹Chen, E., ¹Ewerbeck, V., and ²Kikinis, R.¹University of Heidelberg, GERMANY and ²Harvard Medical School, USA

2:50 p.m.

2 Years Follow Up - A Prospective Randomized Controlled Trial of a Computer Navigated Placement of Two Different Uncemented Hip Cups¹Wiese, M., ¹Rubenthaler, F., ¹Warkentin, H., ²Langlotz U., and ³Bernsmann, K.¹St. Josef Hospital, GERMANY, ²Medivision, SWITZERLAND, and³Girardet Clinic Essen, GERMANY

2:55 p.m.

Poster Session and Exhibit Inspection

3:30 p.m.

Workshop Series I (Workshops 1, 3, 5, 7, 9, 11-see page 24 for listing)

3:30 p.m.

Rotation D

4:05 p.m.

Rotation E

4:40 p.m.

Rotation F

5:15 p.m.

General Assembly of CAOS International8:00 p.m. -
11:00 p.m.**Conference Banquet at Palace of the Governors**

Saturday, June 22, 2002

7:00 a.m.

SESSION 11

8:00 a.m.

Registration and Continental Breakfast

THA

Session Chairs - Bauer, A. and Jaramaz, B.

Non CT-Based Total Hip Replacement System: Accuracy and Reproducibility of Target Leg Length and Femoral Anteversion

Croitoru, H., Tate, P.M., Fu, L., and Sati, M.
Cedara Software Corp., CANADA

8:10 a.m.

A Hybrid CT-Free Navigation System for Total Hip Arthroplasty

¹Zheng, G., ¹Marx, A., ¹Langlotz, U., ²Widmer, K.H.,
¹Nolte, M., ³Bernsmann, K., ¹Buttaro, M., and ¹Nolte, L.-P.
¹University of Bern, SWITZERLAND, ²Kantonsspital Bruderholz, SWITZERLAND, and
³Giradet Clinic, GERMANY

8:20 a.m.

Primary Rotational Stability of Hip Endoprosthesis Stems after Manual and Robot Assisted Surgery

Prymka, M., Petersen, W., Vogiatzis, M., and Hassenpflug, J.
University of Kiel, GERMANY

8:30 a.m.

DISCUSSION

8:40 a.m.

A Computer Guidance System for Preoperative Planning and Intraoperative Placement of the Femoral Component during Total Hip Replacement Surgery

¹Kubiak-Langer, M., ¹Langlotz, F., ¹Bächler, R., ²Richolt, J., ¹Nolte, L.-P., and ²Kerschbaumer, F.
¹University of Bern, SWITZERLAND and
²Orthopaedic University Clinic Friedrichsheim, GERMANY

8:50 a.m.

MINARO - A New Approach for Minimal Invasive Total Hip Revision Surgery

Radermacher, K., Ohnsorge, J., Dela Fuente, M., Schkommodau, E., and Wirtz, D.C.
University Clinic Aachen, GERMANY

9:00 a.m.

Mini-Incision Technique utilizing Surgical Navigation Tools for Total Hip Arthroplasty

¹DiGioia, A.M., III, ²Plakseychuk, A., ¹Jaramaz, B., ¹Levison, T.J., and ¹Moody, J.E.
¹The Western Pennsylvania Hospital, USA and ²University of Pittsburgh, USA

9:10 a.m.

DISCUSSION

SESSION 12

Imaging

Session Chairs - Krettek, C. and Székely, G.

9:20 a.m.

Direct 3D Navigation with an Isocentric Mobile C-Arm

Mitschke, M. and Ritter, D.
Siemens Medical Solutions, GERMANY

9:30 a.m.

Adapting the C-Arm Fluoroscope for Image Guided Orthopaedic Surgery

^{1,3}Suhm, N., ²Müller, P., ¹Koller, S., ¹Schmucki, D., ²Bopp, U., ³Jacob, A.L.,
³Messmer, P., and ³Regazzoni, P.
¹AO Development Institute, SWITZERLAND,
²University of Applied Sciences, SWITZERLAND, and
³University Hospital of Basel, SWITZERLAND

9:40 a.m.	Real ISO- C3D- C-Arm based Navigation-Comparison to CT-Based and 2D- C-Arm based Navigation for Pelvic Screw Fixation ¹ König, B., ² Wälti, H., ¹ Schäffler, A., ¹ Stöckle, U., ¹ Haas, N.P., and ² Nolte, L.-P. ¹ Charité Berlin, GERMANY and ² University of Bern, SWITZERLAND
9:50 a.m.	2.5 D Ultrasound Measurement of the Geometry of the Lower Extremities Keppler, P., Gebhard, F., and Kinzl, L. University of Ulm, GERMANY
10:00 a.m.	First Clinical Experience in Inherent Registration Techniques with Mobile Three-Dimensional (3D) Fluoroscopy for Matching Free Navigation - Preliminary Report of a New Method for Intraoperative Navigation ¹ Grützner, P.A., ¹ Vock, B., ¹ Holz, F., ² Wälti, H., ² Nolte, L.-P., ³ Euler, E., and ¹ Wentzensen, A. ¹ University of Heidelberg, GERMANY, ² University of Bern, SWITZERLAND, and ³ University of Munich, GERMANY
10:10 a.m.	DISCUSSION
10:20 a.m.	Poster Session and Exhibit Inspection
10:50 a.m.	Workshop Series II (Workshops 2, 4, 6, 8, 10, 12-see page 24 for listing)
10:50 a.m.	Rotation A
11:25 a.m.	Rotation B
12:00 p.m.	Rotation C
12:30 p.m.	Poster Session and Exhibit Inspection (Box Lunch)
1:30 p.m.	Rotation D
2:05 p.m.	Rotation E
2:40 p.m.	Rotation F
3:15 p.m.	Conference Adjourns
4:45 p.m.	Busses Depart for Movie Studio Ranch
5:15 p.m.	Movie Studio Ranch BBQ and Awards Ceremony

Sunday, June 23, 2002

8:00 a.m.	Registration and Continental Breakfast
9:00 a.m.	Surgical Academy
12:00 p.m.	Surgical Academy Adjourns

Posters

TKA

The Computer Navigation System in TKA - Three Years Experience with Orthopilot
Confalonieri, N., Cerea, P., Motavalli, K., and Manzotti, A.
Istituti Clinici di Perfezionamento (CTO), ITALY

Dynamic Measurement of the Coronal Femorotibial Angle by Computer Assisted Total Knee Arthroplasty Implantation

Jenny, J.-Y. and Boeri, C.
Center for Orthopaedic and Trauma Surgery of Strasbourg, FRANCE

Contribution of Computer Navigation in the Evaluation of Femoral Rotation during Total Knee Replacement

¹Saragaglia, D., ¹Chaussard, C., ²Liss, P., ¹Pichon, H., ¹Berne, D., and ¹Chaker, M.
¹CHU de Grenoble, FRANCE; and ²Hôpital de Voiron, FRANCE

Computer Assisted Implantation of Total Knee Arthroplasty - First Experiences in 50 Implantations using the SurgiGATE-KneeTKA System

¹Wendl, K., ¹Grützner P.A., ²Kunz, M., ²Nolte, L.-P., ¹Vock, B., and ¹Wentzensen, A.
¹University of Heidelberg, GERMANY and ²University of Bern, SWITZERLAND

The Accuracy of Computed Tomography-Based Image-Guided Knee Replacement

Nabeyama, R., Matsuda, S., Miura, H., Mawatari, T., Tanaka, K., and Iwamoto, Y.
Kyushu University, JAPAN

CT-Based Navigation System for Total Knee Replacement - A Pilot Study

Nizard, R., Vangaver, E., Dekeuver, P., and Sedel, L.
Lariboisiere Hospital, FRANCE

Navigation in Knee Arthroplasty without Rigid-Body at the Iliac Crest - A Prospective Comparative Study using Conventional and Computer Aided Instrumentation

Clemens, U., Miehke, R.K., and Bause, L.
St. Josef Stift, GERMANY

Precision Measurement of the Navigated, Reconstructed, Mechanical Axis on Implantation of a Total Knee Prosthesis - Description of Method and Results

Ritschl, P., Fuiko, R., and Zettl, R.
Orthopädisches Krankenhaus Gersthof, AUSTRIA

A Three-Dimensional Evaluation for Positioning of Total Knee Arthroplasty and its Application for Osteotomy Control by a System of Three-Dimensional Leg Alignment Assessment with Digital X-Ray

¹Koga, Y., ²Sato, T., ¹Nishino, K., and ³Ogura, H.
¹Niigata Kobari Hospital, JAPAN, ²Niigata University, JAPAN, and
³Niigata TechnoWing, Co., Ltd., JAPAN

Applications of Surgical Navigation to Primary Total Knee Arthroplasty

^{1,2,3}Murphy, S., ^{1,3}Gobeze, R., ⁴Lyons, C., ⁴Harber, C., and ⁵Goodchild, G.
¹Beth Israel-Deaconess Medical Center, USA, ²New England Baptist Hospital, USA,
³Harvard Medical School, USA, ⁴Richards, Smith and Nephew Surgical Navigation, USA, and
⁵Medtronic Surgical Navigation Technology, USA

A Step to Modularity: A New Non-Image Guided Application for Navigated Total Knee Replacement (TKR) with the Navitrack™ System: First Clinical Experience

Mattes, Th. and Puhl, W.

Orthopedic University Hospital, GERMANY

The Bilateral Symmetry of the Individual Knees

¹Pashmineh-Azar, A., ²Niess, C., ¹Schnabel, M., ¹Junge, A., and ¹Gotzen, L.

¹Phillips-University of Marburg, GERMANY and ²Johann Wolfgang Goethe-University, GERMANY

Total Knee Replacement - Standard Surgical Technique vs. Computer Assisted Approach

¹deSteiger, R., ²Swoboda, B., ³Westphal, C., and ⁴Slomczykowski, M.

¹Royal Melbourne Hospital, AUSTRALIA, ²Waldkrankenhaus St. Marien, GERMANY,

³Klinikum Neustadt, GERMANY, and ⁴DePuy International, UK

A Planning System for Active Constraint Robot Knee Surgery

¹Harris, S., ¹Rodriguez y Baena, F., ¹Jakopiec, M., ¹Gomes, P., ²Cobb, J., and ¹Davies, B.

¹Imperial College of Science, Technology and Medicine, UK and

²University College London Hospitals Trust, UK

Early Experience with a CT based Image Guided System for Total Knee Arthroplasty

Swank, M.L.

Cincinnati Orthopaedic Research Institute, USA

Computer Navigation for Unicompartmental Knee Arthroplasty

¹Tatsumi, I., ¹Nakajima, S., ²Ikebuchi, T.,

¹Kadaya, Y., ¹Kobayashi, A., and ¹Yamano, Y.

¹Osaka City University, JAPAN and ²Osaka Pref. Rehabilitation Hospital, JAPAN

CAS in the TKR using the Fluoroscopic Based Ion-Station

The First Results of a Prospective Study

Kettrukat, M., Hagena, F.-W., Christ, R.-M., and Hackbarth, M.

Auguste-Viktoria-Klinik Bad Oeynhausen, GERMANY

The Rationale for and Initial Experience with a Knee Suite

of Computer Assisted Surgical Applications

¹Stulberg, S.D., ²Eichhorn, J., ³Saragaglia, D., and ⁴Jenny, J.-Y.

¹Northwestern University School of Medicine, USA,

²Orthopädisch-Sporttraumatologische Praxis, GERMANY,

³Grenoble University, FRANCE, and ⁴Centre de Traumatologie et d'Orthopedie, FRANCE

A Generalized Model for Predicting Force and Accuracy in Bone Milling with Application to Computer-Assisted Knee Arthroplasty

¹Plaskos, C., ¹Hodgson, A.J., and ²Masri, B.A.

¹University of British Columbia, CANADA and ²Vancouver General Hospital, CANADA

THA

First Italian Clinical Experience with Robot-Assisted Total Hip Replacement

¹Pipino, F., ¹Franchin, F., ¹Sanguineti, F., ¹Grandizio, M., and ²Fadda, M.

¹Genoa University, ITALY and ²URS Ortho, GERMANY

2 Years Follow Up - A Prospective Randomized Controlled Trial of a Computer Navigated Placement of Two Different Uncemented Hip Cups

¹Wiese, M., ¹Rubenthaler, F., ¹Warkentin, H., ²Langlotz U., and ³Bernsmann, K.

¹St. Josef Hospital, GERMANY, ²Medivision, SWITZERLAND, and

³Girardet Clinic Essen, GERMANY

Optimal Range of Motion in Total Hip Arthroplasty Requires Compliant Combinations of Cup and Stem Positioning during Surgery - Recommendations for Computer-Assisted Navigation

Widmer, K.-H.

Kantonsspital Bruderholz, SWITZERLAND

New Application in Robot-Assisted Surgery: Primary Considerations

¹Bauer, A., ²Torres Sánchez, R., and ²Fernández Meroño, J.M.

¹Marbella High Care, SPAIN and ²Polytechnic University of Cartagena, SPAIN

Applications of Surgical Navigation to Primary Total Hip Arthroplasty

Murphy, S., Gobezie, R., and Deshmukh, R.

Beth Israel-Deaconess Medical Center, USA,

New England Baptist Bone and Joint Institute, USA and Harvard Medical School, USA

Experience with a Hybrid CT-Free Navigation System for Acetabular Cup Placement in Clinical Routine

¹Grützner, P.A., ¹Vock, B., ²Langlotz, U., ²Wälti, H.,

²Rose, E., ¹Korber, J., ²Nolte, L.-P., and ¹Wentzensen, A.

¹University of Heidelberg, GERMANY and ²University of Bern, SWITZERLAND

XALIGN: Determining Acetabular Cup Position Following Total Hip Replacement - A Patient Data Study

¹Jaramaz, B., ²Cassenti, L., ²LaRose, D., ²Kanade, T., ¹Moody, J., ¹DiGioia, A.M., III,

¹Levison, T., and ²Dostmohamed, H.

¹The Western Pennsylvania Hospital, USA and ²Carnegie Mellon University, USA

Effects of Large-Diameter Femoral Implant Heads on Functional Range of Motion after THR

Nikou, C., Jaramaz, B., and DiGioia, A.M., III

The Western Pennsylvania Hospital, USA

Computer Assisted Hip-Cup Placement vs. Conventional Free-Hand Hip-Cup Placement

¹Stockheim, M., ²Michaelis, U., ²Krödel, A., ³Steffen, R., ³Eppe, ¹Kuehle, P., ¹Rubenthaler, F., ¹Wiese, M., and ¹Haaker, R.

¹Ruhr-University Bochum, GERMANY, ²Alfried Krupp Hospital, GERMANY, and

³Marien-Hospital, GERMANY

PACS-Based X-Ray Planning System for Hip Replacement

Croitoru, H., Tate, P.M., Fu, L., and Sati, M.

Cedara Software Corp., CANADA

“Pinless” System for Robodoc

¹Barger, W.L., ²Sahay, A., ²Cohan, S., and ²Mittlestadt, B.

¹Sutter General Hospital, USA and ²Integrated Surgical Systems, Inc., USA

Spine

The Role of CAOS in the Training of Junior Orthopaedic Surgeons: Pedicle Screw Placement in Porcine Lumbar Spines

¹Kurta, I.C., ²Richards, P.J., ¹Dove, M., ¹Jasani, V., ¹Wynn Jones, C.H.,

¹Rahmatalla, A., ³MacKenzie, G., and ^{1,4}Dove, J.

¹City General Hospital, UK, ²North Staffordshire NHS Trust, UK,

³Keele University, UK, and ⁴Stoke-on-Trent, UK

Accuracy of Traditional, CT- and C-Arm-Based Navigated Transpedicular Drilling in the Thoracic and Lumbar Spine in a Standardized in Vitro Model

Arand, M., Schempf, M., Fleiter, T., Kinzl, L., and Gebhard, F.
University of Ulm, GERMANY

Placement of Cervical Pedicle, - Lateral-Mass - and C1-C2 - Screws with Virtual Computed Fluoroscopy - A Feasibility Study

Fritsch, E.W., Gödde, S., Seil, R., Duchow, J.
University of Saarland, GERMANY

An Easy Way to Check Accuracy of Spinal Navigation

Grieshammer, Th., Geske, R., Träger, U., and Schulz, W.
Klinikum Neubrandenburg, GERMANY

Fluoroscopy-Based Navigation in the Lumbar Spine - A Preclinical Study for Pedicle Screw Insertion in Human Cadavers

Bodammer, A., König, B., Scholz, M., Kandziora, F., Schnake, K., Stöckle, U., and Haas, N.P.
Charité Berlin, GERMANY

Intraoperative Planning and Fluoroscopic Navigation of Minimal-Invasive Approach for Kyphoplasty

Ohnsorge, J.A.K., Weisskopf, M., Radermacher, K., Prescher, A., Mahnken, A., and Siebert, C.
*University Clinic Aachen, GERMANY and
Helmholtz-Institute for Biomedical Engineering, GERMANY*

Non-Invasive MR to 3D Rotational X-Ray Registration of Vertebral Bodies

^{1,2}van de Kraats, E.B., ^{1,2}van Walsum, Th., ¹Verlaan, J.-J., and ^{1,2}Niessen, W.J.
¹University Medical Centre Utrecht, THE NETHERLANDS and
²Image Sciences Institute, THE NETHERLANDS

Registration

The Comparison of Different Matching Typs and Validation of the Surfacematching in a CT Based Knee Navigation System

¹Wiese, M., ¹Schmidt, K., ¹Willburger, R.E., ²Immerz, M., ¹Seidel, K., and ¹Awakowicz, A.
¹St. Josef Hospital, GERMANY and ²BrainLAB, GERMANY

Comparison of Three Different Ultrasound B-Mode Calibration Methods

Kowal, J., Amstutz, C.A., and Nolte, L.-P.
University of Bern, SWITZERLAND

Ultrasonic Registration Techniques

^{1,2}Toppolo, J.L., ¹Kowal, J., and ¹Nolte, L.-P.
¹University of Bern, SWITZERLAND and ²University of Western Australia, AUSTRALIA

A-Mode Ultrasound based Registration in Total Hip Arthroplasty

Heger, St., Portheine, F., Ohnsorge, J., and Radermacher, K.
University Clinic Aachen, GERMANY

Minimally Invasive Registration Techniques for Surgical Navigation using Intraoperative Ultrasound

¹Amin, D.V., ¹Kanade, T., ²DiGioia, A.M., III, ²Jaramaz, B.,
²Moody, J.E., ²Nikou, C., ¹LaBarca, R.S., and ²Levison, T.J.
¹Carnegie Mellon University, USA and ²Western Pennsylvania Hospital, USA

Accuracy

Accuracy of CT-Based Acetabular Cup Planning with Respect to the Pelvic Frontal Plane¹Steffen, R., ¹Eppe, T., ¹Reichwein, F., and ²Marx, A.¹Marienkrankenhaus Kaiserswerth, GERMANY and ²University of Bern, SWITZERLAND**An Accuracy Assessment Framework for Orthopaedic Surgical Navigation Systems**¹Moody, J.E., ¹Mor, A.B., ²LaBarca, R.S., ³Sell, D., ¹Nikou, C., ²Omer, A.,¹Jaramaz, B., and ¹DiGioia, A.M., III¹The Western Pennsylvania Hospital, USA, ²Carnegie Mellon University, USA, and³CASurgica, Inc., USA**Computer Assisted Fracture Reduction: A Novel Method for Analysis of Accuracy**¹Geerling, J., ¹Hüfner, T., ¹Citak, M., ¹Richter, M.,¹Gössling, T., ²Pohlemann, T., ³Tarte, S., and ¹Krettek, C.¹Hannover Medical School, GERMANY, ²University of Saarland, GERMANY, and³University of Bern, SWITZERLANDImaging
Fluoro**Quantitative Evaluation of Intraoperative Radiation Doses in Patients using Computer-Assisted Surgery**

Gebhard, F., Kraus, M., Kinzl, L., and Arand, M.

University of Ulm, GERMANY

Validation of Fluoroscopy based Navigation in the Collum Femoris¹Schep, N.W.L., ²van Walsum, Th., ¹Broeders, I.A.M.J., and ¹van der Werken, Chr.¹University Medical Center Utrecht, THE NETHERLANDS and²Image Sciences Institute, THE NETHERLANDS**Robust Automatic C-Arm Calibration for Fluoroscopy-Based Navigation**

Livyatan, H., Yaniv, Z., and Joskowicz, L.

Hebrew University of Jerusalem, ISRAEL

Fluoroscopy based Surgical Navigation for Guidewire Placement in Femoral Neck Fractures: A Controlled Experimental Study¹Beck, T., ²Zuna, I., ¹Marazzi, C., ¹Städele, H., ¹Messmer, P., ¹Regazzoni, P., and ^{1,3}Suhm, N.¹University of Basel, SWITZERLAND, ²German Cancer Research Center, GERMANY, and³AO Development Institute, SWITZERLAND**Anatomical Registration Implementation and Results for a “Hands-On” Robotic Knee Surgery System**¹Rodriguez y Baena, F.M., ¹Davies, B.L., ¹Jakopec, M.,¹Harris, S.J., ¹Gomes, P.S.F., and ²Cobb, J.¹Imperial College, UK and ²University College London Hospitals Trust, UK**Positioning of Sacroiliac Screws with Fluoroscopy based Navigation Technique**¹Schep, N.W.L., ²van den Bosch, E.W., ²Haverlag, R., and ²van Vugt, A.B.¹University Medical Center Utrecht, THE NETHERLANDS and²University Hospital Rotterdam, THE NETHERLANDS**Surface/Volume Models Reconstruction of Bones for Surgical Planning**¹Archip, N., ²Dessenne, V., and ¹Erard, P.-J.¹University of Neuchâtel, SWITZERLAND and ²Medivision/STRATEC, SWITZERLAND

New Applications

Preliminary Results of a Prospective Randomized Clinical Trial: The Placement of Sacroiliac Screws with Fluoroscopy based Image Guidance vs. Conventional Fluoroscopic Technique

Hinsche, A.F., Giannoudis, P.V., and Smith, R.M.
St. James's University Hospital Leeds, UK

Virtual Fluoroscopy for Screw Fixations in Pelvic Surgery

Stoeckle, U., Koenig, B., Dahne, M., and Haas, N.P.
Humboldt University Berlin, GERMANY

A Co-Registration Technique for Fluoroscopically-Guided Robotic Surgery

Prasad, S.K., Li, M., Ramey, N.A., Frassica, F.J., and Taylor, R.H.
Johns Hopkins University, USA

Computer Assisted High Tibial Valgus Osteotomy for Treatment of Genu Varum - A Study of 19 Cases

¹Saragaglia, D., ¹Pradel, P., ¹Chaussard, C., ²Liss, P., ¹Pichon, H., ¹Berne, D., and ¹Chaker, M.
¹CHU de Grenoble, FRANCE and ²Hôpital de Voiron, FRANCE

Combined C-Arm and Laser Projection Prototype Device

¹Chen, E., ¹Ewerbeck, V., and ²Kikinis, R.
¹University of Heidelberg, GERMANY and ²Harvard Medical School, USA

A Novel Laser Guidance System to Present the Information of Navigation Directly in the Surgical Field

¹Sugano, N., ¹Sasama, T., ¹Koyama, T., ¹Nakajima, Y., ¹Sato, Y., ¹Tamura, S., ²Momoi, Y.,
³Fujie, M., ⁴Sakuma, I., and ⁵Yonenobu, K.
¹Osaka University Medical School, JAPAN, ²Hitachi Ltd, JAPAN, ³Waseda University, JAPAN,
⁴University of Tokyo, JAPAN, and ⁵Osaka Minami National Hospital, JAPAN

Robot-Guided Long Bone Intramedullary Distal Locking: Concept and Preliminary Results

¹Joskowicz, L., ²Milgrom, C., ^{3,4}Shoham, M., ¹Yaniv, Z., and ²Simkin, A.
¹Hebrew University of Jerusalem, ISRAEL, ²Hadassah University Hospital, ISRAEL,
³Technion, ISRAEL, and ⁴Masor Robotics Ltd., ISRAEL

Fluoroscopy based Navigated Drilling of the Femoral Head for Avascular Necrosis: A Laboratory and Clinical Study

Duchow, J., Fritsch, E., and Seil, R.
University of Saarland, GERMANY

Use of Industrial Robots for Computer Assisted Orthopaedics Surgery - Application to the Locking of Intramedullary Nails

¹Torres, R., ¹Aznar, M., ¹Fuentes, J.A., ²Bauer, A., and ¹Fernández, J.M.
¹Polytechnic University of Cartagena, SPAIN and
²Marbella High Care Orthopaedic Clinic, SPAIN

Towards Computer Assisted Surgery in Total Shoulder Joint Replacement

^{1,2}Valstar, E.R., ¹Botha, C.P., ²Roziing, P.M., ¹Post, F.H.,
¹Vossepoel, A.M., and ¹van der Helm, F.C.T.
¹Delft University of Technology, THE NETHERLANDS and
²Leiden University Medical Center, THE NETHERLANDS

3D Simulation-Based Analysis of Changes in the Femoro-Tibial Angle and Hip-Knee-Ankle Angle due to Lower Extremity Rotation on Preoperative Radiographs and Rotational Shift in High Tibial Osteotomy

¹Kawakami, H., ¹Sugano, N., ¹Hagio, K., ²Yonenobu, K., ¹Ochi, T., ¹Yoshikawa, H., ³Nagaoka, T., ⁴Hattori, A., and ⁴Suzuki, N.

¹Osaka University Graduate School of Medicine, JAPAN, ²Osaka-Minami National Hospital, JAPAN, ³Waseda University, JAPAN, and ⁴Jikei University School of Medicine, JAPAN

High Tibial Osteotomy - Use of the OrthoPilot Navigation System

Prymka, M., Petersen, W., and Hassenpflug, J.
University of Kiel, GERMANY

An Integrated Training and Monitoring Solution for CAS Systems: Design and Testing

¹de Siebenthal, J., ²Grützner, P.A., ³Barea, C., and ¹Langlotz, F.

¹University of Bern, SWITZERLAND, ²BG Unfallklinik, GERMANY, and

³University Hospital of Geneva, SWITZERLAND

Workspaces of the Human Knee

¹Fuller, J.E., ²Murphy, M.C., and ³Brown, G.A.

¹Schlumberger Reservoir Completions, USA, ²Louisiana State University, USA, and

³University of Minnesota, USA

The Multifunctional Therapy Suite in Basel: A New Approach to Elective Guided Therapy and Emergency Single Stage Diagnosis and Treatment

Beck, T.M., Messmer, P., Regazzoni, P., and Jacob, A. L.

University Hospital of Basel, SWITZERLAND

3D-Navigation with Iso-C-3D Datasets: Experimental Evaluation in Pedicle Screw and SI-Screw Placement and First Clinical Cases

Euler, E., Heining, S.M., Riquarts, C., and Mutschler, W.

University of Munich, GERMANY

Intraoperative Measurement of Torsion Angle and Leg-Length in Trauma Surgery using Iso-C-3D-Datasets

Heining, S.M., Euler, E., Wirth, S., Wassermann, S., and Mutschler, W.

University of Munich, GERMANY

A Minimally Invasive Approach to Pelvic Osteolysis

Prasad, S., Li, M., Ramey, N., Frassica, F., and Taylor, R.

Johns Hopkins University, USA

Minimally Invasive Computer-Assisted Excision of Osteoid Osteoma

Athwal, G.S., Ellis, R.E., Pichora, D.R., and Rudan, J.R.

Queen's University, CANADA

CAS Systems in Clinical Routine - Are They Usable?

¹Zimolong, A., ¹Wu, T., ²Zimolong, B., ³de Siebenthal, J., and ¹Radermacher, K.

¹University Clinic Aachen, GERMANY, ²Ruhr-Universität Bochum, GERMANY, and

³University of Bern, SWITZERLAND

New Indications for Computer Assisted Surgery: Ankle Fusion

Hüfner, T., Geerling, J., Oldag, G., Gössling, T., Richter, M., and Krettek, C.

Hannover Medical School, GERMANY

Trauma

Assessment of Preoperative Computer Simulated Proximal Femoral Osteotomy in Finite Element Analysis¹Hung, S.S., ¹Lee, M.S., ²Chen, W.B., and ²Ho, S.S.¹Chang Gung Memorial Hospital, TAIWAN and ²Chung Yuan University, TAIWAN**Internal Fixation of Hip Fractures with Computer Assisted Surgery (CAS) Initial Experience**

Schep, N.W.L., Verleisdonk, E.J.M., Broeders, I.A.M.J., and van der Werken, Chr.

University Medical Centre Utrecht, THE NETHERLANDS

Anterior Cruciate Ligament Reconstruction using a CAOS System: Preliminary Results¹Ménétrey, J., ¹Suvà, D., ¹Genoud, P., ²Sati, M., ¹Hoffmeyer, P., and ¹Fritschy, D.¹University Hospital of Geneva, SWITZERLAND and ²University of Bern, SWITZERLAND**CARED - Computer Assisted Reduction - A New Concept for Fracture Treatment**¹Schmucki, D., ²Messmer, P., ²Suhm, N., and ¹Koller, S.¹AO Development Institute, SWITZERLAND and ²University Hospital Basel, SWITZERLAND**Minimally Invasive Image-Guided Surgery in the Treatment of Intertrochanteric Fractures**¹Pojedinec, J., ²Goodchild, G., and ³Harber, C.¹Private Practice, USA, ²Medtronic, USA, and ³Smith & Nephew, USA**Virtual Reduction of Pelvic and Acetabular Fractures**¹Tarte, S., ¹Langlotz, F., ²Hüfner, T., and ¹Nolte, L.-P.¹University of Bern, SWITZERLAND and ²Hanover Medical School, GERMANY**Clinical Experience in ACL Reconstruction with the Ortho-Pilot System**

Eichhorn, J.

Orthopädisch-Sporttraumatologische Praxis, GERMANY

A New Standard Planning for the Graft Insertion Sites in the Computer Assisted Reconstruction of the Anterior Cruciate Ligament¹Pashmineh-Azar, A., ²Niess, C., ¹Junge, A., ¹Schnabel, M., and ¹Gotzen, L.¹Philipps-University of Marburg, GERMANY and²Johann Wolfgang Goethe-University, GERMANY**Computer-Aided Trauma Surgery - Preliminary Report of 25 Cases**

Gautheron, T., Daaboul, K., Benjelloun, S., Alfon, J., Macey, S.,

Buyst, K., Rebreyend, B., Coutier, M., and Scrimgeour, K.

Centre Hospitalier Moutiers, FRANCE

Workshops

- BrainLAB: Image Guided Surgery for TKR and THR
- CT-Less TKR Application with the Navitrack-System
- GALILEO: More Accurate Bone Resections in TKR
- HipNav
- Image Guided Surgery using Fluoroscopy for TKA/THA/Trauma
- KneeNav
- OrthoPilot: CT FREE TKA and Cup Navigation

Conference Information

The conference begins with registration at the Sweeney Convention Center on Wednesday, June 19th from 3:00 p.m. -6:00 p.m. followed by an informal Welcome Reception at the Inn at Loretto from 6:30 p.m. - 9:30 p.m. The official technical program will begin Thursday morning at 8:00 a.m. and adjourn on Saturday, June 22nd at 3:30 p.m. The conference will be followed by the Surgical Academy on Sunday, June 23rd beginning with registration at 8:00 a.m. and adjourning at 12:00 p.m.

Please join us out at the J.W. Eaves Movie Ranch for the official Conference awards ceremony and western bar-b-que! (This is a ticketed event and is not included in registration fee). Tickets for this event should be purchased in advance. Transportation for this event will be provided by bus and will depart from conference hotels at 4:45 p.m. (transportation will be provided).

Location

Sweeney Convention Center, 201 West Marcy Street, Santa Fe, NM, 87504-0909
1-800-777-2489, or 1-505-955-6217, Fax 1-505-955-6223

Registration

Registration begins on Wednesday, June 19th and continues on Thursday, June 20th at 7:00 a.m. Continental breakfast will be served each morning starting at 7:00 a.m.

Your registration fee includes workshop, syllabus, continental breakfasts, refreshment breaks, 3 luncheons, Welcome Reception, and the Friday Night Banquet.

Cancellation Policy

A 20% non-refundable cancellation fee will be assessed to all cancellations received before June 5th, 2002. No refunds will be made after that date. All refunds must be requested in writing no later than June 5th.

Registration Fees

Status:	Before 05-17-02	After 05-17-02	Plus Surgical Academy
Physician/Researcher-ICAOS Member	\$500	\$650	\$100
Physician/Researcher-ICAOS Non-Member ¹	\$700	\$850	\$100
Presenters	\$500	\$500	\$100
Resident/Fellows/ Students ²	\$400	\$450	\$50
Allied Health Professionals ³	\$250	\$400	\$50
Commercial Representatives	\$750	\$900	\$300 ⁴

¹Includes one year membership to ICAOS

²with letter from department head or residency coordinator

³Nurses, PAs, Tech's, Operating Room Professionals

⁴Space available (wait listed by receipt of registration form)

One-Half Day CAOS Surgical Academy

Attending	Surgical Academy Only
Physicians	\$300
Residents/Fellow ²	\$300
Allied Health Professionals ³	\$200

Special Events

Additional Friday Night Banquet Guest(s) \$ 70.00

Awards ceremony/BBQ at the Movie Studio Ranch \$ 80.00 each (not included in tuition)

Special Needs

We encourage participation by all individuals. If you have special needs, please notify us at least two weeks prior to the conference. Call us at 1-619-232-9499.

Lodging

Santa Fe has what you need to enjoy your stay. From downtown hotels to historic bed and breakfasts, to secluded lodgings surrounded by natural beauty and quiet ambiance.

Please note that hotel accommodations are not included in the registration fee. To make reservations, please contact one of the official Conference hotels directly. Please identify yourself with the CAOS International Conference to receive the negotiated discount rates (plus room tax of 11.4376%). The cut-off date for the special group rates listed below is **May 19, 2002**. All space will be released after that date. Reservations made after the deadline will be confirmed subject to availability of space and the possibility of non-group discounted rates.

Hotels within walking distance:



Hilton at Santa Fe - \$169, 5-8 minute walk of the Sweeney Convention Center.
1-505-988-2811 or 1-800-336-3676 www.hiltonofsantafe.com

Hotel Plaza Real - \$119 - \$169, 5 minute walk of the Sweeney Convention Center.
1-505-988-4900 www.buynewmexico.com



Inn at Loretto - \$209, 10-15 minute walk of the Sweeney Convention Center.
1-505-988-5531 or 1-800-727-5531 www.hotelloretto.com

Hotels within a 10 minute driving distance:

Shuttle service will be provided, by the hotel, to and from the Sweeney Convention Center in the mornings and immediately following the meeting each day.



Radisson Santa Fe - \$99
1-505-992-5800 or 1-800-333-3333 www.radisson.com/santafenm



Courtyard by Marriott - \$89 single/\$99 double
1-505-473-2800 or 1-800-777-3347 www.courtyard.com

For descriptions of the above hotels and more hotel listings visit www.santafe.org/hotels.html or www.santafehotels.com

Transportation: Air



The conference has selected *Delta Air Lines* and *Southwest Airlines* as the official airlines for U.S. based flights.

To begin your meeting successfully with Delta Airlines, follow these simple steps:

1. Call Delta Meeting Network Sales and Service toll free at 1-800-241-6760; between 8:00 a.m. - 11:00 p.m. EST/M-S
2. Refer to File Number: 186163A



To begin your meeting successfully with Southwest Airlines, follow these simple steps:

1. Call Southwest Airlines Group and Meeting Reservation Office toll free at 1-800-433-5368.
2. Refer to Event I.D. Code: R5201

Transportation: Ground

The Albuquerque International Airport (a.k.a Sunport), is just an hour's drive from Santa Fe. From the airport, you can either rent a car or use a shuttle bus service for a scenic drive to Santa Fe.

Car Rental

The conference has selected *Hertz* as the official car rental company.



To get to your meeting successfully with Hertz, follow these simple steps:

1. Call Hertz Meeting Sales Desk at 1-405-749-4434 or toll free at 1-800-654-2240
2. Refer to Meeting Number: 02SD0002

Shuttle Transportation

Please contact one of the below companies directly for current schedule, pick-up locations, rates, and to make a reservation.

Herrera Santa Fe Shuttle

1-505-243-2300 or 1-888-833-2300 www.santafeshuttle.com
\$38 Round-trip

Sandia Shuttle Express

1-505-243-3244 or 1-888-775-5696 www.sandiashuttle.com
\$35 Round-trip paid in advance with a credit card.
\$40 round-trip on-site

Local Activities:

For local activities please visit the following web sites.
<http://www.santafe.org>

Social Events

Welcome Reception

Inn at Loretto

(included in registration fee)

www.hotelloretto.com

Wednesday, June 19, 2002

6:30 p.m. - 9:30 p.m.

211 Old Santa Fe Trail

The Inn at Loretto was built on the site of a former Catholic academy established by the Sisters of Loretto in 1853. The hotel's architecturally stunning adobe design rises like a mesa in sensitive unison with the small, but still active Loretto Chapel.

Conference Banquet

Palace of the Governors

(included in registration fee, guest tickets available)

www.palaceofthegovernors.org

Friday, June 21, 2002

8:00 p.m. - 10:30 p.m.

105 West Palace Avenue

It is the first structure built in Santa Fe after its founding, the Palace is the oldest public building in continuous use in the United States. It served as the capitol until after the 1860's. Beleaguered Spanish defended themselves in the Palace during a 10-day siege in the Pueblo Revolt of 1680.

Wild, Wild, West BBQ and Awards Ceremony Dinner

J.W. Eaves Movie Ranch

(ticketed event, not included in registration fee)

Saturday, June 22, 2002

5:15 p.m. (transportation provided)

Join us out at the J.W. Eaves Movie Ranch for a western ho down! Once you exit from the bus, the town comes to life as the bar-b-que is cooking, cowboys and outlaws stroll the dirt streets as a honky tonk piano is playing with dance hall girls dancing in one of the saloons.

J.W. Eaves Movie Ranch was built in 1969 for the Cheyenne Social Club with Jimmy Stewart, Henry Fonda and Shirley Jones. Since that time, hundreds of major productions, documentaries and commercials have been filmed including western favorites like John Wayne's, "Chisum" and "The Cowboys", as well as "Desperado", "Silverado", "Wyatt Earp", and "Young Guns".

Walk the same dusty streets as Johnny Cash, Clint Eastwood, Kevin Costner, Danny Glover, Willie Nelson, Gene Hackman, Emilio Estevez, and many more.

Registration Information

The preferred method to register for the conference is with on-line registration. Register today by visiting the web-site at www.caos-international.org/2002. Another method of registration is to complete the form in this brochure and mail it along with a check or money order (U.S. dollars only) or fax with credit card payment to the address listed below. To receive the early registration discounts, please return the attached Registration Form by the discount deadlines to:

CAOS International 2002 Conference

c/o PMMI
2320 6th Avenue
San Diego, CA 92101-1643
Telephone: 1-619-232-9499
Fax: 1-619-232-0799

The fee includes workshops, syllabus, continental breakfasts, refreshment breaks, 3 luncheons, Welcome Reception, Friday Night Banquet, and a 20% non-refundable cancellation fee. All requests for cancellations are to be made in writing and are subject to a 20% cancellation fee. No refunds will be made after June 5, 2002.

Bankwire Information

Please pre-pay any and all bank fees charged from your bank before sending. We must receive your bankwire amount in full to match your registration tuition payment and all fees.

Please add/transfer \$15/US Dollars for each wire transfer. If registering for more than one participant, you may still transfer a single total amount for all registration payments. You do not have to process \$15 per person, just \$15 per bank transfer.

Please include the registrants name on each bank wire.

Please contact us by fax (1-619-232-0799) or e-mail (registration@pmmiconferences.com) with the bank name from which you have transferred payment, name of registering person, # of transfers, amounts, and date sent. A confirmation of receipt of payment will be sent when we receive the notice from the bank.

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If you have any questions or need additional information or assistance, please do not hesitate to contact us at CAOS International 2002 Conference, c/o PMMI, 2320 6th Avenue, San Diego, CA 92101-1643, USA, 1-619-232-9499, fax 1-619-232-0799, info@caos2002.org.

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If you require special arrangements, please indicate your request below.

Dietary: _____

Physical: _____

REGISTRATION FEES

Registration includes Conference syllabus, welcome reception, breaks, banquet, and workshops. Payment for registration is due upon submission of registration. All refunds must be requested in writing no later than **June 05, 2002**, and will be assessed a 20% administrative fee. No refunds will be made after **June 05, 2002**.

Status:

	Before 05-17-02	After 05-17-02	Plus Surgical Academy	
Physician/Researcher-ICAOS Member	<input type="checkbox"/> \$500	<input type="checkbox"/> \$650	<input type="checkbox"/> \$100	\$ _____
Physician/Researcher-ICAOS Non-Member ¹	<input type="checkbox"/> \$700	<input type="checkbox"/> \$850	<input type="checkbox"/> \$100	\$ _____
Presenters	<input type="checkbox"/> \$500	<input type="checkbox"/> \$500	<input type="checkbox"/> \$100	\$ _____
Resident/Fellows/ Students ²	<input type="checkbox"/> \$400	<input type="checkbox"/> \$450	<input type="checkbox"/> \$50	\$ _____
Allied Health Professionals ³	<input type="checkbox"/> \$250	<input type="checkbox"/> \$400	<input type="checkbox"/> \$50	\$ _____
Commercial Representatives	<input type="checkbox"/> \$750	<input type="checkbox"/> \$900	<input type="checkbox"/> \$300 ⁴	\$ _____

¹Includes one year membership to ICAOS²with letter from department head or residency coordinator³Nurses, PAs, Tech's, Operating Room Professionals⁴Space available (wait listed by receipt of registration form)**One-Half Day CAOS Surgical Academy**

	Surgical Academy Only	
Attending Physicians	<input type="checkbox"/> \$300	\$ _____
Residents/Fellow ²	<input type="checkbox"/> \$300	\$ _____
Allied Health Professionals ³	<input type="checkbox"/> \$200	\$ _____

Special Events

Additional Friday Night Banquet Guest(s) _____ @ \$70.00 each \$ _____

Awards ceremony/BBQ at the Movie Studio Ranch _____ @ \$80.00 each \$ _____

TOTAL \$ _____**FORM OF PAYMENT**
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