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HIMA

HEALTH INDUSTRY MANUFACTURERS ASSOCIATION

ALAN H. MAGAZINE

PRESIDENT

January 22, 1992

Mr. John Cohrsson
Associate Director
Council on Competitiveness
Old Executive Office Building Room 286
17th and Pennsylvania Avenue, NW
Washington, DC 20501

Dear Mr. Cohrsson:

Thank you for the opportunity to discuss HIMA's concerns regarding the economic consequences of the recent deterioration in the FDA regulatory environment for the health care technology industry. Since our meeting, the trade press has published reports which provide statistical corroboration for our worst fears.

During fiscal year 1991, FDA will have approved only 27 PMAs. This represents a 43% decrease compared to the 47 PMAs approved in fiscal year 1990 and a 52% decrease compared to the 56 approved in 1989. FDA attributes the decline in approvals to companies failing its newly implemented pre-approval good manufacturing practices inspection program. This delay in approvals is denying early patient access to, in some cases, life saving technologies. If FDA implements this pre-approval inspection program for 510(k)s, other products will be subject to marketing delays.

Enclosed with this letter are the following additional documents which you requested:

- a copy of my correspondence with FDA regarding statements of certain enforcement officials
- a copy of results of a recent survey of our membership, indicating that 30% report increasing problems with FDA in the past year
- a paper showing that the U.S. lags behind our international competitors in device approval times, citing pacemakers as an example
- estimates provided by breast implant manufacturers of the probable domestic employment implications of FDA action regarding this product. This data is provided for use within the Administration only and should not be shared with the press.

World Leaders in Health Care Innovation

1200 G STREET, N.W., SUITE 400

WASHINGTON, D.C. 20005

(202)783-8700

FAX (202) 783-8750

I hope you find these useful. I would be pleased to provide any additional information you think might assist you and the Council staff in pursuing this problem.

Sincerely,

Alan H. Magazine

AHM/MRS/jb
Enclosures

HIMA
HEALTH INDUSTRY MANUFACTURERS ASSOCIATION

ALAN H. MAGAZINE
PRESIDENT

October 7, 1991

Mr. James Benson
Director, Center for Devices & Radiological
Health and Deputy Commissioner of Food and Drugs
Food and Drug Administration
5600 Fishers Lane, HF-2
Room 1471
Rockville, Maryland 20857

Dear Jim:

We were surprised by what we read in the September 20 Devices and Diagnostics Letter. According to the report, Ronald Johnson, Director of CDRH's Division of Compliance and Surveillance, seems to have encouraged the FDA field staff to search out an instance in which to use the agency's new civil penalty authority.

HIMA supports enforcement of the law. We recognize that civil penalties are among the enforcement tools available to FDA. But if the agency intends to start from the premise that a civil penalty will be assessed -- and as an afterthought to identify the case where this will occur -- then we think what you're planning is both backwards and wrong.

As you know, HIMA has devoted significant resources in recent years to educating its members toward excellence in meeting FDA's requirements. The most recent example was the July workshop on new product submissions, attended by over three hundred highly motivated industry employees. More generally, HIMA has tried to foster a spirit of cooperation with FDA as a means toward an overriding end: Assuring patient access to technologies that save and improve lives.

If not clarified, Mr. Johnson's comments could harm the cooperative spirit we are trying to foster. They could divert attention from the genuine compliance you are trying to ensure. And they could undermine the credibility the agency needs to do its job.

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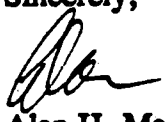
(202) 783-8700
FAX (202) 783-8750

HIMA is mindful of the pressures under which FDA is now operating. But this is no excuse. Enforcement should be fair and even-handed.

On behalf of the HIMA membership, I register my strongest objection to Mr. Johnson's comments.

Sincerely,



Alan H. Magazine

AHM/GWH:gln

cc: Commissioner David Kessler
Ronald Johnson
HIMA Board of Directors

HEALTH INDUSTRY MANUFACTURERS ASSOCIATION

U.S. (FDA) REGULATORY ENVIRONMENT: IMPACT ON MEDICAL DEVICE INDUSTRY

FDA, partly in reaction to (ongoing) Congressional oversight and criticism, has beefed up their enforcement activities and actions against medical device manufacturers. Even though the generic drug scandal practices did not extend to medical devices, the subsequent (and ongoing) IG and GAO investigations have made FDA's Center for Devices and Radiological Health (CDRH) more inclined to tighten its controls on the medical device industry. CDRH has also been given new authority with the passage of the Safe Medical Devices Act of 1990.

The environment at CDRH has changed dramatically over the past year. Approvals for new products have slowed, access to reviewers has been curtailed, strict new regulations and guidelines have been issued and factory inspections have become more frequent priorities. The CDRH leadership, reflecting the Commissioner's priorities, says enforcement will be aggressive based on a low threshold for action; and that approvals can only be speeded up with improved submissions from industry. It will be virtually impossible for small companies, which make up a large portion of the industry and from which many innovative ideas come, to keep up with the CDRH's numerous new approval and factory requirements. The problems at CDRH result from continued criticism and a lack of resources. The resulting paranoia and slow decision-making at headquarters and difficult factory inspections in the field have resulted in an environment of suspicion, uncertainty and very low-level decision-making. The CDRH staff has expressed frustration ". . . that we never have the time to do our original tasks when we respond so constantly to the external forces and oversight activities". Washington D.C.-based medical device lawyers and others with long experience with FDA are expressing the opinion that the regulatory environment has never been more difficult for the regulated companies.

The lengthening product approval process is of particular concern to the medical device industry. The industry can support strong enforcement that is fair, consistent and predictable, but such enforcement must be in balance with a strong emphasis on approvals for new devices. Currently, U.S. (FDA) approvals take much longer than other countries. For example, a pacemaker approval requires 3-4 months in Germany, 4 months in Canada (with some actually exempted from any approval), 4 months in Japan and more than a year in the U.S.

What is needed at this point is the following:

1. Additional resources, directed at the product approval process, so that innovative, patient-needed devices are quickly brought to market.

2. Substantially less oversight from Congress and cessation of the constant IG and GAO investigators.

3. Change in the regulatory environment, including positive statements about the medical device industry and the importance of its international competitiveness from Congress, the Commissioner and the Administration.

4. A balanced approach to the regulation of medical devices with product approvals and enforcement both given appropriate emphasis and funding.

World Leaders in Health Care Innovation

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WASHINGTON, D.C. 20005

(202)783-8700

FAX (202) 783-8750

THE MAIN FINDINGS

Changes in the FDA Regulatory Environment

Forty-one percent of the executives interviewed said FDA enforcement actions at their firms were tougher in 1991 than in previous years. The larger the firm, the more prevalent that view, so that among the 14 largest companies in the survey, 10 of them (or 71 percent) said enforcement has become tougher. Among the bulk of HIMA members, firms with sales of under $20 million, 51 of the 145 surveyed (35 percent), said enforcement has become tougher. Only two people in the survey, less than 1 percent of those interviewed, said enforcement had become weaker.

The conviction that enforcement has toughened exists to about the same extent in every segment of the health care technology industry. Among firms manufacturing surgical instruments, for example, 41 percent report toughening; among supplies and disposables firms, 44 percent; among durable medical equipment firms, 39 percent, and so on.

As part of the changing environment, 30 percent of those interviewed said relations between their company and FDA device evaluation staff had worsened in 1991, compared to only 10 percent who said relations had improved. As might be expected, among those who said relations had worsened, a majority also said FDA enforcement had gotten tougher in 1991.

Among those who said enforcement became tougher in 1991, one in every five also said that relations between their firms and the FDA field staff had gotten worse. And in their volunteered comments, a number of people complained about the FDA field staff: "They are grossly undermanned," said one respondent. "Our worst problem has been field reps," said another. "HIMA has to try to do something about this."

How Firms Are Coping With the New FDA Environment

The medical device industry is taking a variety of approaches in response to the new regulatory environment. As might be expected, larger firms with greater resources tend to be the most active. The survey asked about seven possible approaches and got the following response:

	% Saying Their Firm Has Taken That Approach
• Improving compliance with GMPs, that is, Good Manufacturing Practices.	84
• Improving the quality of new product submissions.	67
• Holding discussions with staff members of CDRH, that is, the Center for Devices and Radiological Health.	41
• Holding discussions with FDA field staff.	37
• Expanding already existing operations outside the United States.	22
• Opening new facilities outside the U.S.	21
• Getting out of some product areas.	14

For every approach listed above, the firms that feel FDA has toughened enforcement against them in 1991 are more likely to be taking that approach than are firms that see no change in enforcement actions.

THE QUESTIONNAIRE

Q1. First, thinking of enforcement actions by the Food and Drug Administration in 1991: Overall, would you say that FDA enforcement actions at your company in 1991 have been tougher than in earlier years, weaker, or about the same?

[41%] Tougher
[1%] Weaker
[48%] About the same
[10%] No opinion

Q2. How about relations between FDA field staff and your company: Would you say those relations improved in 1991 compared to earlier years, got worse, or stayed about the same?

[12%] Improved
[10%] Got worse
[65%] About the same
[13%] No opinion

Q3. And how about relations between FDA device evaluation staff and your company: Would you say those relations improved in 1991 compared to earlier years, got worse, or stayed about the same?

[10%] Improved
[30%] Got worse
[45%] About the same
[15%] No opinion

Q4. I'm going to mention a few approaches firms may take in dealing with the new FDA regulatory environment. For each approach, please tell me if your firm has begun doing that in response to the new regulatory environment, or if it is considering that approach, or if it is not considering that approach.

		Yes, Are Doing That	Under Consideration	Not Doing or Considering
A)	Holding discussions with staff members of CDRH, that is, the Center for Devices and Radiological Health.	[41%]	[19%]	[37%]
B)	Holding discussions with FDA field staff.	[37%]	[16%]	[44%]
C)	Improving the quality of new product submissions.	[67%]	[10%]	[18%]
D)	Getting out of some product areas.	[14%]	[15%]	[68%]

E)	Opening new facilities outside the U.S.	[21%]	[14%]	[63%]
F)	Expanding already existing operations outside the U.S.	[22%]	[12%]	[63%]
G)	Improving compliance with GMPs, that is, Good Manufacturing Practices.	[84%]	[3%]	[11%]

THE FINDINGS IN DETAIL

Q1. First, thinking of enforcement actions by the Food and Drug Administration in 1991: Overall, would you say that FDA enforcement actions at your company in 1991 have been tougher than in earlier years, weaker, or about the same?

[41%] Tougher	[48%] About the same
[1%] Weaker	[10%] No opinion

COMMENTS: The larger the company, the more widespread the perception that enforcement has become tougher[1]:

Size of Firm	% Saying Enforcement Is Tougher
Smaller Firms (n=145)	35%
Medium Sized (n=51)	45%
Large (n=19)	53%
Very Large (n=14)	71%

Q2. How about relations between FDA field staff and your company: Would you say those relations improved in 1991 compared to earlier years, got worse, or stayed about the same?

[12%] Improved	[65%] About the same
[10%] Got worse	[13%] No opinion

Q3. And how about relations between FDA device evaluation staff and your company: Would you say those relations improved in 1991 compared to earlier years, got worse, or stayed about the same?

[10%] Improved	[45%] About the same
[30%] Got worse	[15%] No opinion

COMMENTS: Forty-five percent of the firms that opened new facilities outside the U.S. in response to the new regulatory environment said relations with the FDA device staff had worsened—the highest proportion of any group.

[1] Figures in this table and others in the Question 4 series do not add up to 100 percent because "Not sure" responses have been omitted.

Q4A. I'm going to mention a few approaches firms may take in dealing with the new FDA regulatory environment. For each approach, please tell me if your firm has begun doing that in response to the new regulatory environment, or if it is considering that approach, or if it is not considering that approach.

	Yes, Are Doing That	Under Consideration	Not Doing or Considering
Holding discussions with staff members of CDRH, that is, the Center for Devices and Radiological Health.	[41%]	[19%]	[37%]

COMMENTS: The larger the HIMA member firm, the more likely it is to be holding discussions with CDRH staff. Of the 14 very large firms in the survey, 12 (or 86 percent) have been holding such discussions; of the 145 smaller firms surveyed, 50 (34 percent) have been holding such discussions.

Q4B. I'm going to mention a few approaches firms may take in dealing with the new FDA regulatory environment. For each approach, please tell me if your firm has begun doing that in response to the new regulatory environment, or if it is considering that approach, or if it is not considering that approach.

	Yes, Are Doing That	Under Consideration	Not Doing or Considering
Holding discussions with FDA field staff.	[37%]	[16%]	[44%]

COMMENTS: Again, the larger the firm, the more likely it is to be taking this action. But the contrast here is not nearly as sharp as in the previous questions.

Q4C. I'm going to mention a few approaches firm may take in dealing with the new FDA regulatory environment. For each approach, please tell me if your firm has begun doing that in response to the new regulatory environment, or if it is considering that approach, of if it is not considering that approach.

	Yes, Are Doing That	Under Consideration	Not Doing or Considering
Improving the quality of new product sub-missions.	[67%]	[10%]	[18%]

COMMENTS: Lopsided majorities in all membership groups say they are improving the quality of new product submissions. Again, the largest firms, presumably the ones with more resources, are leading the way—27 of the 33 large or very large firms, or 82 percent of them—say they have improved their submissions.

Q4D. I'm going to mention a few approaches firms may take in dealing with the new FDA regulatory environment. For each approach, please tell me if your firm has begun doing that in response to the new regulatory environment, or if it is considering that approach, or if it is not considering that approach.

	Yes, Are Doing That	Under Consideration	Not Doing or Considering
Getting out of some product areas.	[14%]	[15%]	[68%]

COMMENTS: This is another inquiry that shows sharp differences between larger and smaller HIMA member firms. Among the 33 large or very large firms in the survey, 2 (or 6 percent) have dropped product areas and 5 (15 percent) are considering such action. But among the 196 smaller and medium-sized firms surveyed, 30, or 15 percent, have gotten out of some product areas, and 29, another 15 percent, are considering doing so.

The firms that have opened or expanded facilities outside the U.S.are more likely than others to have dropped product areas or to be considering dropping them.

Q4E. I'm going to mention a few approaches firms may take in dealing with the new FDA regulatory environment. For each approach, please tell me if your firm has begun doing that in response to the new regulatory environment, or if it is considering that approach, or if it is not considering that approach.

	Yes, Are Doing That	Under Consideration	Not Doing or Considering
Opening new facilities outside the U.S.	[21%]	[14%]	[63]

COMMENTS: There is not much difference in the extent to which smaller and larger firms are opening new facilities outside the U.S.: for example, 63 percent of the firms in the survey are smaller ones; 55 percent of the firms opening new facilities outside the U.S. are smaller ones. Half the firms taking this action say FDA enforcement at their firm was tougher in 1991 than in previous years. More than 6 in 10 of the firms opening new overseas facilities also are expanding already existing facilities outside the U.S.

Q4F. I'm going to mention a few approaches firms may take in dealing with the new FDA regulatory environment. For each approach, please tell me if your firm has begun doing that in response to the new regulatory environment, or if it is considering that approach, or if it is not considering that approach.

	Yes, Are Doing That	Under Consideration	Not Doing or Considering
Expanding already existing operations outside the U.S.	[22%]	[12%]	[63%]

COMMENTS: A majority of the firms taking this approach—55 percent—say that FDA enforcement at their company got tougher in 1991. Another way of expressing the same finding: 3 of every 10 firms that feel enforcement got tougher in 1991 have expanded operations outside the U.S. as a countermeasure. That figure tends to minimize the flight taking place; however, in that, as of 1990, only about two-thirds of HIMA firms had any overseas operations, and another 1 in 5 had very small operations. Taking those factors into account, it seems likely that almost half the firms that could expand overseas operations have done so.

Most likely to expand overseas operations were Southern firms. Ten of the 26 Southern firms in the survey, or 38 percent, say they have expanded operations outside the U.S. in response to the new regulatory environment.

Q4G. I'm going to mention a few approaches firms may take in dealing with the new FDA regulatory environment. For each approach, please tell me if your firm has begun doing that in response to the new regulatory environment, or if it is considering that approach, or if it is not considering that approach.

	Yes, Are Doing That	Under Consideration	Not Doing or Considering
Improving compliance with GPMs, that is, Good Manufacturing Practices	[84%]	[3%]	[11%]

How Firms Serving the Various Market Segments View Enforcement[2]

Information on the market segment served applies to 126 of the 229 firms taking part in the survey. The total number of firms listed in the table below adds to more than 126 because many firms serve more than one market segment. This material is best used for thrust of the findings, not precision, and special caution is in order for the market segments that are served by a small number of firms.

Segments Served	--Enforcement Is-- Tougher Now	Same
Surgical instruments (n=126)	[41%]	[48%]
Supplies & disposables (n=82)	[44%]	[48%]
Durable medical equipment (n=44)	[39%]	[52%]
Implantable devices (n=36)	[44%]	[44%]
In vitro diagnostics (n=30)	[43%]	[43%]
Patient monitoring (n=27)	[48%]	[48%]
Respiratory therapy (n=20)	[35%]	[60%]
Consumer products (n=18)	[33%]	[67%]
Health care information (n=15)	[41%]	[48%]
Diagnostic imaging equipment (n=11)	[27%]	[73%]

[2]The findings presented here are based in part on a mail survey done for HIMA in 1990 in which Official Representatives were asked to state which market segments their firm served.

STATE OF MICHIGAN
International Office
Michigan Department of Commerce
525 W. Ottawa, P.O. Box 30225
Lansing, Michigan 48909
Telephone: (517) 373-6390
Facsimile: (517) 335-2521

DATE: March 11, 1992 PAGE: 1 of 14

TO: Gary Gershowitz
White House Researcher

FROM:
Pat Vander Voord, Ph.D.
Senior Trade Specialist

COPIES TO: LESLIE TOUMA EXEC. OFFICE Fax #: (202) 456-6218

SUBJECT: Michigan Export Info.

Urgent Normal FYI Only Respond By:

Mr. Gershowitz:

I have not spoken to Ms. Marie Twardowski, Director for Marketing to the Middle E ast and Africa, of STRYKER CORP., but I did leave a message on her voice mail in refere nce to our conversation (yours and mine). She may be reached at (616) 385-2600. Great gal!

I informed Marie that I was giving you information relative to her/her company's participation in the huge medical show, Moscow, May, 1990. I indicated that you did want to know if they had subsequently made significant sales in the (then) USSR. We had nine Michigan companies participating, as I recall.

I am FAXing along copies of newly prepared info on our programs and projects.

I HAVE NOT been able to break out the auto related exports. the USDOC is our source for that info and they have not yet responded to my question. Perhaps if you deal with them directly.

Hope this helps and best regards,

THE WHITE HOUSE

WASHINGTON

March 10, 1992

MEMORANDUM FOR RESEARCHER

THROUGH: NANCY BENSON (I typed this in a hurry)

FROM: MICHELE NIX

RE: KALAMAZOO EVENT

Stryker Corp. - Kalamazoo, MI

(Medical Division) Arrive at Battle Creek Airport - roped off receiving line. Possible informal remarks. Hand held microphone.

Tour facility of Stryker Medical Corp. (factory area)

10:05 a.m. Address Employees of Facility (350 people) 10 minutes in length.

Contacts:

David Simpson, Chief Financial Officer, Stryker (talk to him first) -- Knows more about export/international sales figures

(616) 385-2600

Harry Carmitchel, Head of Sight (Stryker Medical) knows more facts about this part
(616) 329-2100

John Brown, Chairman of the Board will introduce POTUS at Stryker Medical facility

March 2, 1992

U.S. News pg. 69 Article where Stryker is listed as # 2 in ranking of United Shareholders Assoc.

Expanding - another site down the road in Kalamazoo - open in the fall

Also expanding assembly area at Medical facility where event is being held

Make most products from scratch. Produce artificial knees hips, etc... Japan #1 customer for artificial hips. 1/3 of products go to off shore markets.

Supportive of President with regard to exporting keeping international markets open.

Experienced 20% growth rate over the past year.

They cut customer cost by producing almost everything by scratch.

COLOR

Michele has a bunch of materials

Corporate Olympics (all Kalamazoo companies participate in this) March 6, 1992. Stryker won some gold and bronze

Banner:
"Quality. When you take it personally, it shows."

Big U.S. flag hangs in factory at all times.

Recently fought off efforts to unionize.

Leave for Detroit

Phone: 202-456-7750

FAX: 202-456-6218

Export sales for '91 one-hundred (1) Million $ = 31% of overall sales; (on pg four of ann report)

Stryker Homer Stryker, MD Orthosurg founded co in 1941.

Stryker family contribution to Madhatters - Portray disabled people in altern positive light.

Al Warner, Dept of Commerce, Office of Automotive Affairs & Consumer Goods: 377-8781

March 11, 1992
5:48 pm
2 Page(s)

To: Doug Chia
White House Speech Writiing

Fax No: 94566218

From: 09.Brown

Subject:

Comments:

March 11, 1992

Memorandum To: Doug Chia/Michele Nix, White House Speech Writing

From: Elaine Brown, Acting Chief Economist, USTR

Subject: Data on State Exports and Related Employment

Here are the state exports and related employment which you requested for Michigan. Please note the Commerce request (as explained in our memo dated February 27, from David Walters) that the 1991 data be identified as "estimates based on national trends". The 1991 estimates below are comparable in definition to those provided Ms. Nix for Georgia in the same February 27 memo.

Estimates for Michigan:

	1987	1991 (Estimated)
Exports (direct and indirect) of Manufactures	$21.7 billion	$39.9 billion
Manufacturing and Non-manufacturing Employment Related to Michigan' Export of Manufactured Product	267,800	400,337

Regarding your question as to how one could shorten and rephrase the term for direct plus indirect exports of manufactures, one might say "state shipments in support of exports" and still be fairly accurate. It would let an educated listener understand this indicates more than just the direct exports originating from that state.

U.S. Department of Commerce
Science and Electronics

Office of Microelectronics and Instrumentation

Facsimile Cover Sheet

from

Michael C. Fuchs
Medical Equipment Industry Analyst

Telephone: (202) 377-0550
Facsimile: (202) 377-2706

To: Joe Duggan Date Sent: 3 / 11 / 92

Company:

At Fax Number: ( ) 456-6218

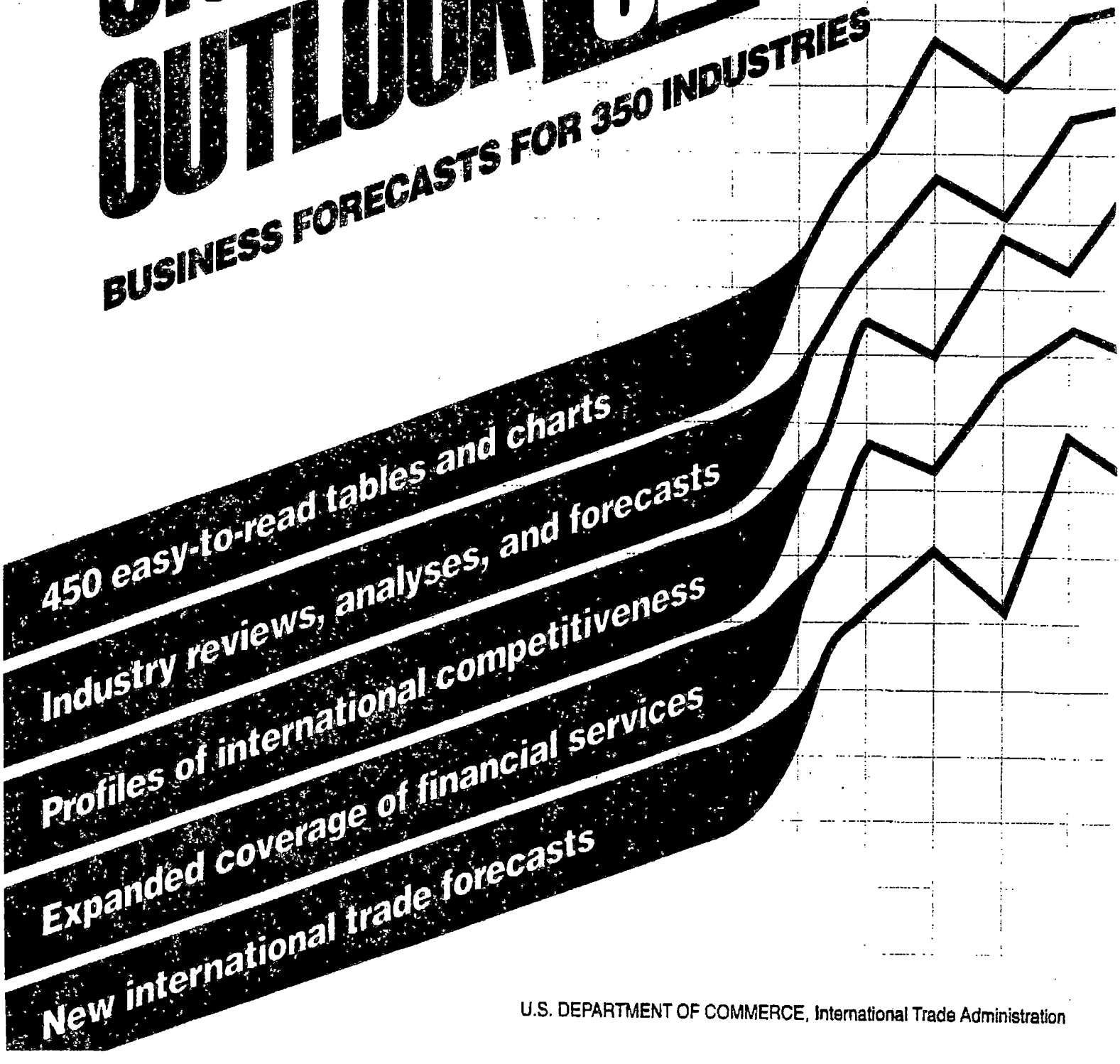
Document Title (if any): Medical Device Information

Number of Pages (including this cover sheet): 11

Comments: Per your request through Ed Rozynski of HHTA & George Kerr of Commerce. If you have any questions, I'd be glad to try to answer or give you relevant contact point in Technology Administration

U.S. INDUSTRIAL OUTLOOK '92

BUSINESS FORECASTS FOR 350 INDUSTRIES



U.S. DEPARTMENT OF COMMERCE, International Trade Administration

45

Medical and Dental Instruments and Supplies

Shipments by the medical and dental equipment industries will increase 7 percent in constant dollar value in 1992, following a 6.2 percent increase in 1991.

Medical equipments represent a wide range of health care products used by physicians to diagnose and treat patients in inpatient and outpatient settings. These range from tongue depressors, to highly sophisticated diagnostic devices that can provide clear images of internal organs.

Medical and dental instruments and supplies include five specific industries: surgical and medical instruments (SIC 3841); surgical appliances and supplies (SIC 3842); dental equipment and supplies (SIC 3843); X-ray apparatus and tubes (SIC 3844), and electromedical equipment (SIC 3845). Items that fall outside the realm of this chapter include diagnostic products, classified under In Vitro and In Vivo Diagnostic Substances (SIC 2835); and surgical gloves, condoms, and similar latex based products, under Fabricated Rubber Products, Not Elsewhere Classified (SIC 3069).

Before reading this chapter, please see "How to Get the Most Out of This Book" on page 1. It will clarify questions you may have concerning data collection procedures, factors affecting trade data, forecasting methodology, the use of constant dollars, the difference between industry and product data, sources and references, and the Standard Industrial Classification system (SIC). For other topics related to this chapter, see chapters 43 (Health and Medical Services), and 44 (Drugs).

Medical equipment manufacturers experienced another strong year of growth with rising trends on all traditional indicators of competitiveness, such as output, employment, and trade. Growth levels were driven by national health care expenditures, which increased 11.1 percent to a record $604 billion in 1989, and strong foreign demand that resulted in a record sixth year of export growth approaching 20 percent.

However, the industries are facing strong challenges in domestic as well as international markets that may slow their historically strong economic performance. These include the costs of new regulatory requirements to ensure product safety and effectiveness, and changes in Medicare coverage and payment policies aimed at curbing spiraling health care costs. One example of the former is the 1990 Safe Medical Devices Act, which redefines many of the procedures for bringing medical devices to the market. Medicare, meanwhile, has implemented a prospective payment system for physicians, as well as for capital items such as computed tomography scanners (CT) and other high-cost radiology products. Medical device companies now are forced to balance the need to expend funds on meeting increased health care regulation with those of funding new medical technologies.

Table 1: U.S. Market for Medical and Dental Instruments and Supplies 1988–92

(in billions of dollars except as noted)

Item	1988	1989	1990	1991	1992	Average Annual Growth 1988–92 (percent)
Shipments[1]	23.8	25.7	27.6	29.6	31.7	7.4
Imports[2,3]	3.0	3.1	3.7	4.0	4.2	8.8
Exports[3]	4.0	4.9	5.6	6.7	7.5	17.0
Consumption	22.8	23.9	25.7	26.9	28.4	5.6
Import share of consumption (percent)	13.2	13.0	14.4	14.9	14.8	2.9

[1]Product shipments measured in current dollars; 1989 data is preliminary; 1990–91 is estimated; 1992 is forecast.
[2]Imports are CIF.
[3]1988 data is reconstructed from the Harmonized System (HS) trade classification implemented in 1989; 1991 data is annualized under the HS sytem; 1992 data is forecast.
SOURCE: U.S. Department of Commerce: Bureau of the Census and International Trade Administration (ITA). Estimates and forecasts by ITA.

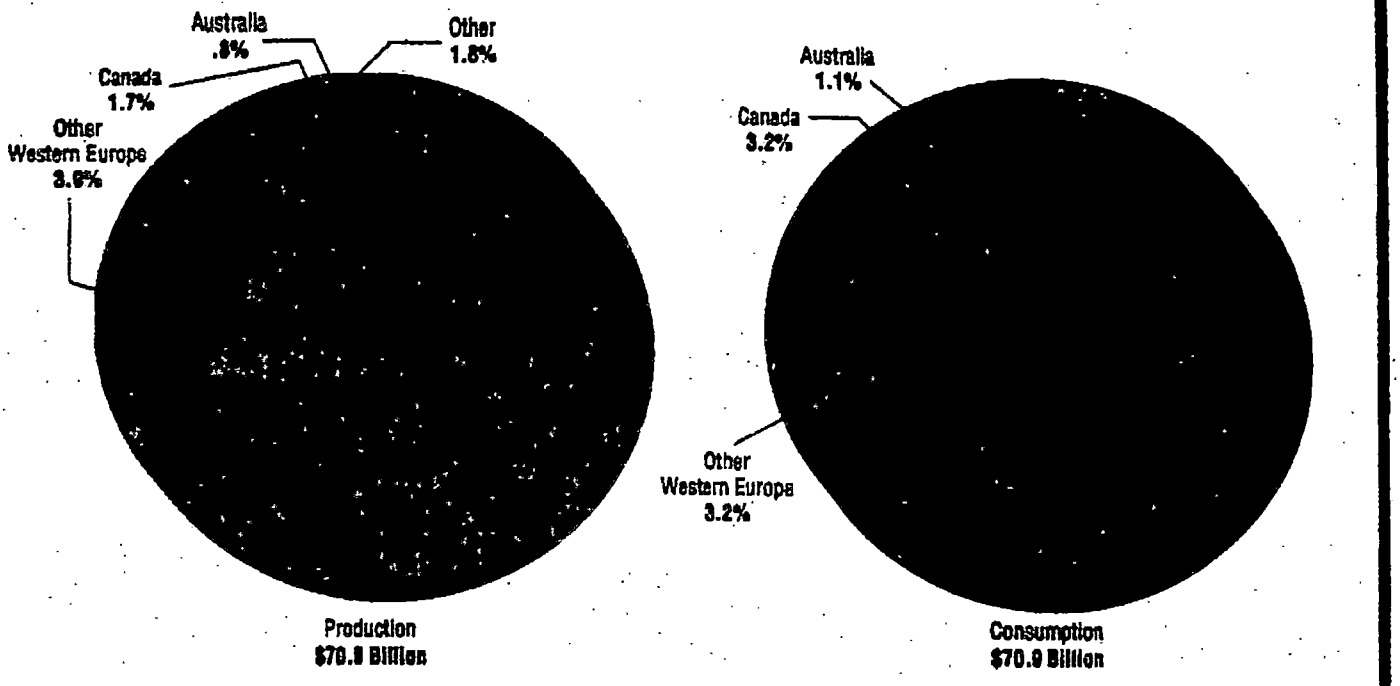
Internationally, implementation of medical device regulations will continue to pose challenges to U.S. firms seeking greater access to foreign markets. In the European Community (EC), officials are harmonizing the approval process to achieve a unified market by the end of 1992. In Japan, the government is revising its health requirements and reimbursement system to control rising health care costs.

Medical Device Regulations

The Safe Medical Devices Act of 1990 is the first comprehensive legislation to cover this industry in 14 years. It establishes new requirements for manufacturers to ensure that products entering the market are safe and effective, particularly in the areas of premarket approval and postmarket surveillance. For example, premarket notification applications, commonly referred to as 510(k)s, for certain types of medical equipment now must include a summary of safety and effectiveness data or

Figure 45-1

World Production and Consumption of Health Care Technology Products, 1991



SOURCE: Health Industry Manufacturers Association, International Affairs.

state that such information is available upon request. The law also requires that for high risk devices introduced after 1990, manufacturers must conduct postmarket surveillance. The Food and Drug Administration (FDA) also may require postmarket surveillance for any other device if the agency believes this action is necessary to protect public health. Other provisions of the law call for regulating hybrid products, which are a combination of device, drug, or biologic; track distribution and end use of certain devices; and require hospitals and other end-users to report deaths associated with faulty medical devices.

The law also calls for stricter FDA enforcement. Manufacturers that are not in full compliance with specified good manufacturer practices may face civil penalties, recalls, or cessation of shipments.

The industry is carefully reviewing whether implementation of this law will slow the FDA approval process, as well as whether costs associated with meeting other regulatory requirements in the act might diminish its ability to compete in domestic and international markets.

Technology

The industry's concerns over the effects of these laws were partially realized in 1990. The number of medical devices that received premarket clearance [510(k)s] by the FDA declined 2.5 percent to 4,748. The number of devices requiring more rigorous premarket approvals declined 16.1 percent to 47. The time to process product approvals by the FDA increased an average of 20 percent in 1990 over 1989.

However, in spite of these trends, the industry continued to develop new products. Research and development (R&D) expenditures for publicly traded medical technology companies continued their upward trend, reaching 6.3 percent in 1990, up from 6.2 percent the previous year. This industry remains one of the most innovative in the United States. Only 32 percent of U.S. medical device patents were of foreign origin in 1990, compared with 48 percent of patents across all industry sectors.

Domestic Market

The U.S. market for medical equipment was expected to increase 4.7 percent in 1991, as manufacturers and end-users gained a better understanding of new medical device regulations. Hospitals, the largest end-users of medical equipment, are continuing to face extreme pressures by the Government and other third-party payers to curtail rising health care expenditures. These cost containment efforts have affected the overall financial status of the hospital industry. Total hospital margins—the difference between total hospital revenues and costs—increased from 3.6 percent to 3.8 percent in 1989. But this still is far below the 7.6 percent reported in 1984, the first year the Government began to reimburse Medicare inpatient procedures a fixed dollar amount under the Prospective Payment System.

As a result, health care delivery will continue to change, which, in turn, will determine the types of products purchased by hospitals and other end-users. For example, inpatient admissions declined 10 percent from 1979 to 1990, while outpatient visits grew nearly 44 percent, the latter now accounting for 27.5

percent of hospital revenue. Nearly one half of surgeries were conducted on an outpatient basis.

The supply of competing providers like ambulatory surgical centers, urgent care centers, comprehensive outpatient rehabilitation facilities, and diagnostic imaging centers have increased rapidly, and are providing significant new markets for medical equipment. In addition, items for home care, such as nutritional therapy products, are expected to grow at rates exceeding 10 percent during the next 5 years.

INTERNATIONAL COMPETITIVENESS

The U.S. medical device industry is the leading supplier in the $65 billion global market, accounting for nearly half of world production. As the U.S. market is expected to slow due to economic reasons, medical device firms are increasingly looking overseas for business opportunities. Medical equipment exports reached approximately $6.7 billion in 1991, representing an increase of 16 percent over 1990. Exports to Europe and Japan, the largest markets outside the United States, led the growth, while Mexico became the seventh leading destination country. Exports have grown at an average of nearly 20 percent annually for the last 6 years, and in 1991 accounted for about 23 percent of product shipments, the highest ratio to date.

Foreign competition continues to intensify, reflected in the 8 percent increase in U.S. imports of medical equipment, to more than $4 billion in 1991. However, this increase is the second time in 3 years that imports have grown at less than double digit rates. The slowed growth in imports, and the sharp increase in exports, combined to contribute to a fifth consecutive annual increase in the U.S. trade surplus for this industry. In 1991, the surplus was $2.7 billion, up 29 percent from the 1990 level.

Western Europe

The $20 billion medical products market in Western Europe is by far the largest outside the United States. Western Europe continues to be this country's largest regional trading partner for medical equipment, accounting for nearly 50 percent of U.S. exports and 51 percent of imports in 1991. U.S. firms also have a strong manufacturing presence in this region. Per capita consumption of health care products in Western Europe, lower than that of the United States, suggests that this affluent region has room for growth, and that it will increase in importance as a market for U.S. manufacturers.

The EC, comprising 12 Western European countries, is developing directives that will determine how medical devices will gain entry into this market. In June 1990, the EC adopted the Active Implantable Medical Device Directive (AIMDD) covering a small product area, including pacemakers and defibrillators. EC member states are scheduled to implement this legislation by July 1, 1992, to become effective December 31, 1992. The EC has established a 2-year transition period for this directive, during which manufacturers can use either EC procedures or the certification procedures of individual countries to demonstrate compliance with essential safety requirements.

The Medical Devices Directive, covering most devices outside of implantable devices to be sold in the EC, is still in a draft stage and is not expected to be made final by the EC Commission and EC Parliament until mid- to late-1992. Similar to the specifications in the AIMDD, products covered by this directive also will be broken into risk categories. Class I devices, those with minor risks, will be subject to manufacturers' self certification that they are in conformance with EC standards. However, devices considered riskier will fall in Class II or Class III. These devices will be subject to third party testing and certification before receiving marketing approval. The "notified bodies" will oversee the certification of medical devices.

The U.S. industry has been pressing the EC to allow notified bodies to subcontract with test houses outside the EC. If the EC agrees to allow the quality assurance registration and certification functions to be subcontracted—as it already has for product testing—this would allow for greater market access.

Japan

Japan is the single most important U.S. trading partner in medical equipment, accounting for 14 percent of U.S. exports and 25 percent of U.S. imports in 1991. Japan is one of the world's premier suppliers of X-ray and electromedical products; it built a $127 million surplus with the United States in these product areas in 1991.

But the $10 billion Japanese market for medical products also makes it the leading foreign market for U.S. manufacturers. As in Western Europe, lower per capita consumption compared to the United States makes this an attractive growth market. In particular, the increased life expectancy of the Japanese population, far higher than that of Western countries, should contribute significantly to the growing Japanese health care market, which is expected to increase at an annual rate of 10 percent during the 1990's.

U.S. Government negotiations continue under the Market-Oriented Sector-Selective (MOSS) forum to address trade issues arising from the Japanese regulatory system designed to protect that country's public health and safety, and health insurance system. Japan's Ministry of Health and Welfare (MHW) is developing price controls on implantable medical devices, such as pacemakers, heart valves, and artificial joints. These are expected to be implemented in April 1992. MHW has upgraded its Office of Medical Devices to division status, combining both research and licensing functions. This should facilitate the approval process for medical devices, which are manufactured domestically and abroad.

Eastern Europe and the Soviet Union

As Eastern Europe and the Soviet Union undertake steps to restructure and modernize their economies, health care and other commercial sectors are receiving high priority. Health care levels remain extremely low because domestic industries are outdated and produce only a fraction of the health equipment needed to meet demand. To improve quality and increase output, these countries are seeking to develop joint partnerships with Western firms. Some countries in Eastern Europe offer relatively advanced health care enterprises as partners. The Soviet Union is seeking to improve output by shifting excess capacity from its defense industry, which historically possessed the most sophisticated production capabilities, to health care and other sectors. Due to a severe shortage of hard currency in the Soviet Union, as well as in Eastern Europe, U.S. firms must employ creative financing techniques to enter those markets. Nonetheless, U.S. exports of medical equipment doubled to Eastern Europe, reaching a level of $20 million in 1991. Exports to the USSR declined 22 percent in 1991 to a level of $21 million. However, this still represents a 150 percent increase over 1989 levels.

EMERGING TECHNOLOGIES
A Survey of Technical and Economic Opportunities

Technology Administration
U.S. Department of Commerce

Spring 1990

EXECUTIVE SUMMARY

This report identifies 12 emerging technologies that feature a combined U.S. market potential of $356 billion in annual product sales by the year 2000. The report discusses competition from the world's other two economic power centers, Japan and the European Community (EC). This study indicates that, if current trends continue, before the year 2000, the United States will lag behind Japan in most emerging technologies and will trail the EC in several of them.

Based on contacts with U.S. industry and information about activities abroad, this report identifies 13 areas of opportunity for improving the climate for economic development of all emerging technologies. The purpose of this report is that of an information base to facilitate discussions between industry, government, labor and academia. In this role, the report should be viewed as a living document subject to revision, updates and expanded coverage, moving along with the process of national consensus formation.

The following figures summarize the content of this document:

•***Emerging Technologies and Markets*** is a tabulation of the emerging technologies together with their market potential. Twelve technologies are covered because they offer substantial economic benefits for U.S. industry by the year 2000. They are grouped into four major categories: Materials, Electronics and Information Systems, Manufacturing Systems, and Life Sciences Applications. The potential product markets are depicted in bar-graph-format: Annual sales in the U.S. market by the year 2000.

Source: Technical knowledge of staff of the U.S. Department of Commerce, in particular scientists and engineers of the National Institute of Standards and Technology; based on interviews with U.S. international science, engineering, and industrial experts.

•***U.S. Versus Japan and the European Community*** depicts the current standing and the trends observed for the major categories of emerging technologies. Trend lines show the comparison to the world's other great economic powers; the horizontal dividing line indicates parity. Concern about the U.S. position increases with the steepness of the drop of a trend line. The two associated tables entitled ***U.S. Report Card*** give a more detailed view of current status and trends in world competition for all 12 emerging technologies.

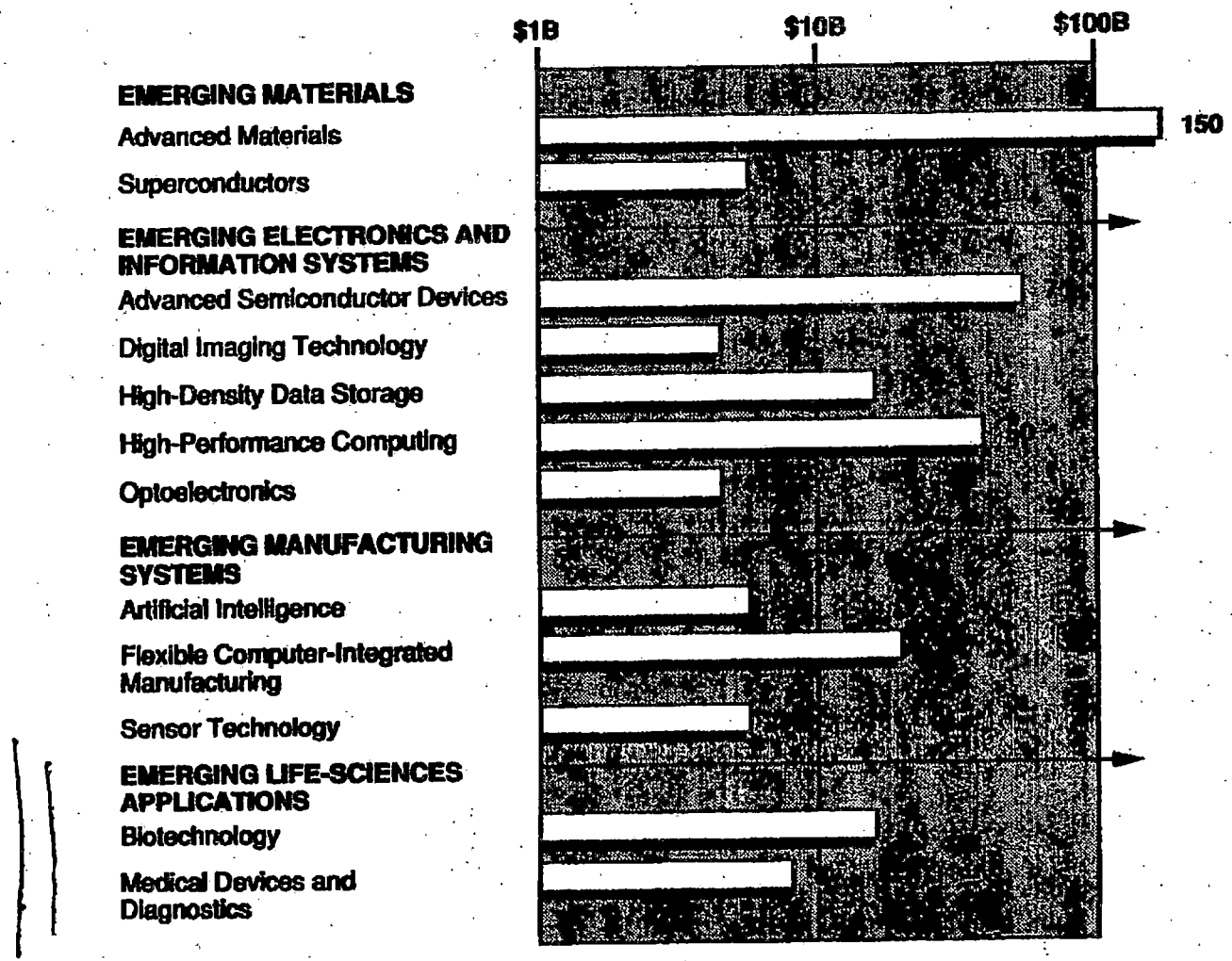
Source: Compiled from the knowledge residing within the Department of Commerce, mostly from contributors within the National Institute of Standards and Technology and the International Trade Administration.

•The four groupings of ***Opportunities*** tabulate 13 areas where actions could be defined and implemented toward improving the climate and capabilities for competitive economic development of all emerging technologies; these 13 areas are not meant to be comprehensive. The four groupings reflect varying degrees of government-industry interaction.

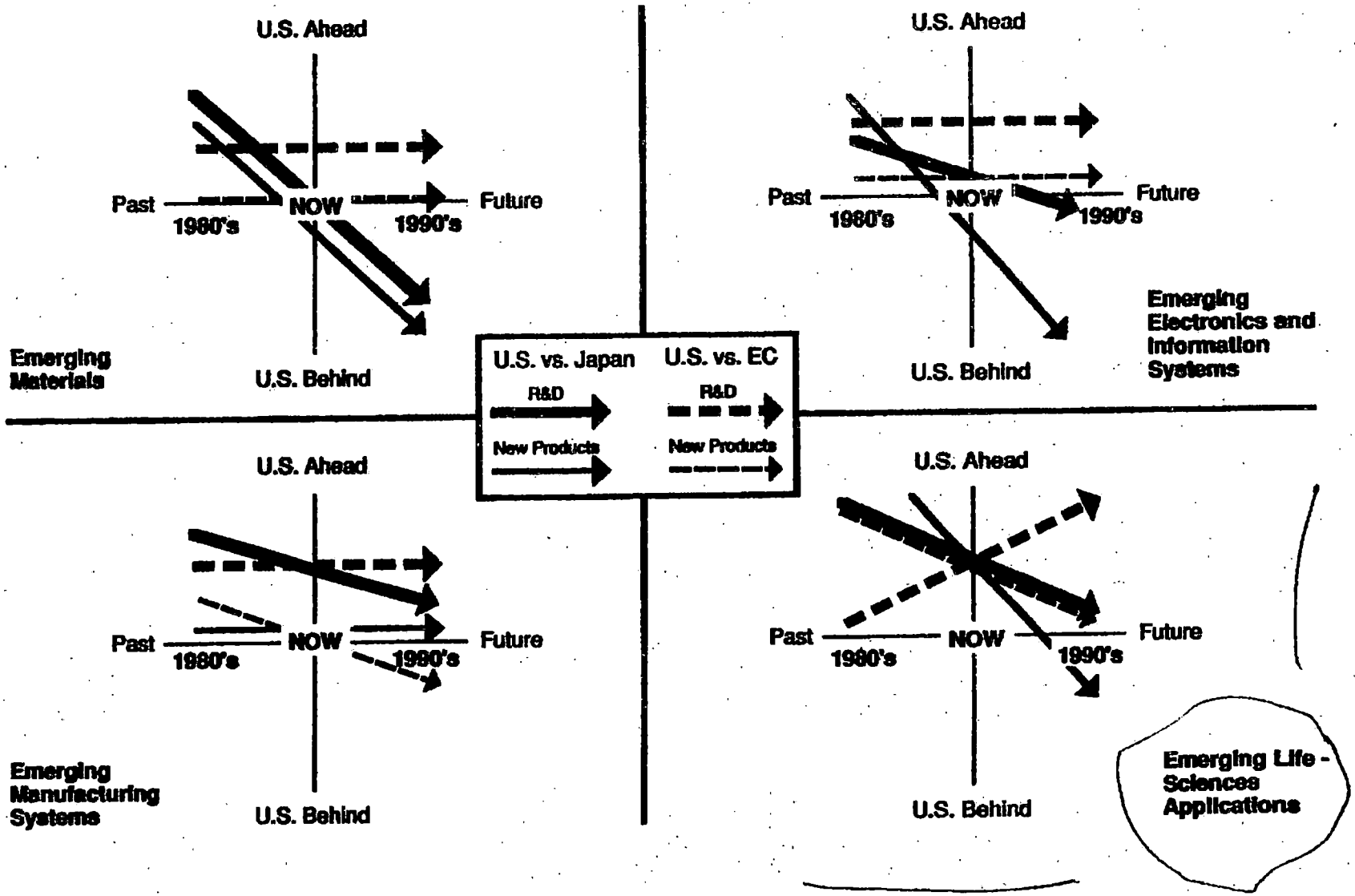
Source: Compiled from the knowledge residing within the Department of Commerce.

EMERGING TECHNOLOGIES AND MARKETS

Annual Sales of $356 Billion in the U.S. by the Year 2000



U.S. VERSUS JAPAN AND THE EC



U.S. REPORT CARD: STATUS 1989

	Versus Japan	Versus Europe
Behind	Advanced Materials Advanced Semiconductor Devices Digital Imaging Technology High-Density Data Storage Optoelectronics	Digital Imaging Technology
Even	Superconductors	Flexible Computer-Integrated Manufacturing Superconductors
Ahead	Artificial Intelligence Biotechnology Flexible Computer-Integrated Manufacturing High-Performance Computing Medical Devices and Diagnostics Sensor Technology	Advanced Materials Advanced Semiconductor Devices Artificial Intelligence Biotechnology High-Density Data Storage High-Performance Computing Medical Devices and Diagnostics Optoelectronics Sensor Technology

U.S. REPORT CARD: TRENDS

	Versus Japan	Versus Europe
Losing Badly	[illegible]	[illegible]
Losing	[illegible]	[illegible]
Holding	Artificial Intelligence Flexible Computer-Integrated Manufacturing	Advanced Materials Advanced Semiconductor Devices High-Density Data Storage Optoelectronics Sensor Technology Superconductors
Gaining		Artificial Intelligence Biotechnology High-Performance Computing

OPPORTUNITIES FOR GOVERNMENT LEADERSHIP

THE COST OF RESEARCH AND MARKET INTRODUCTION

The Cost of Capital Determines the Business Horizon Especially for the Introduction of New Technology

- National Savings Rate
- Federal Budget
- Tax Laws

EXPORT POLICY

New Technologies Are the Strongest Assurance for Maintaining a Superior National Security Posture

- Speed of Approval Process
- Foreign Availability of Similar Products
- Re-Export Controls

REGULATORY CONSTRAINTS

New Products Require Evaluations of Their Impact on Health, Safety and Environment That Are Often Lengthy and Costly

- Streamlining Procedures and Harnessing Market Incentives
- Proper Balance of Protection Versus Economics
- Large Differences in Requirements Between Countries

LAWS OF PRODUCT LIABILITY

New Technologies and New Uses Create High Risks as Regards the Degree of Liability Exposure

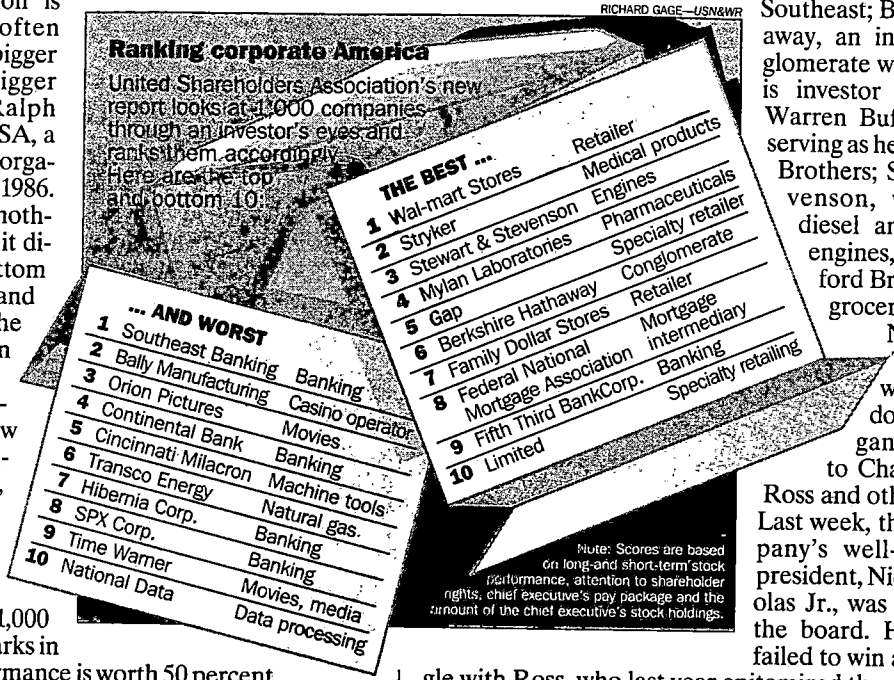
- Limited Versus Unlimited Exposure
- Court Versus Out-of-Court Pathways
- Multiplicity of Laws Here and Abroad

BY JACK EGAN

A shareholder's report card

There's no shortage of available yardsticks for weighing, judging and ultimately ranking leading companies. But at a time when both executive pay and management accountability (or the lack of it) to stockholders increasingly are front-burner issues, a new tally by United Shareholders Association is especially pertinent.

Unlike, say, the well-known *Fortune* 500, which is based solely on sales volume, USA's "Shareholder 1,000"* measures what investors care about: how a company's stock is doing and how its management creates value for investors rather than rewarding itself. "One of the big problems in executive compensation is that packages are often based on size—the bigger the company, the bigger the pay," notes Ralph Whitworth, head of USA, a self-styled grass-roots organization founded in 1986. Size, he says, means nothing to investors unless it directly relates to the bottom line. General Motors and IBM may be among the largest companies in America, he observes, but their financial performance in the past few years has been decidedly subpar. Accordingly, GM shows up 577th and IBM 561st out of 1,000.



USA assigns a score to each of the 1,000 companies based on marks in four areas. Stock performance is worth 50 percent of the total—half long-term and half short-term. Attention to shareholder rights is worth 25 percent. Executive compensation counts for 15 percent; frugality is a plus. And the final 10 percent, a new feature this year, measures the percentage of shares owned by management. A high percentage is viewed with approval, because executives have a direct stake in the company's performance. "They think like owners rather than bureaucrats," notes Whitworth.

Bargain CEO. For the third straight year, Wal-Mart, which last year overtook Sears as the largest U.S. retailer, is in first place. The booming discount-department-store chain not only ranked high for its sizzling and sustained rise in stock price (up 94 percent in 1991 and 4,800 percent over the past 10 years) but also paced the rest in parsimonious executive compensation. Wal-Mart Chief Executive Officer David Glass's pay package totaled $980,000 in 1990. That's a lot—but it was some 90 percent less than what the other CEOs in the survey would have received had their companies done equally well.

Many high-ranked companies are fast-growing smaller firms. No. 2 Stryker Corp., for example, makes medical and surgical products and had sales last year of only $360 million. But its earnings rose 40 percent and its stock went up 220 percent, moving it up from the 20th spot last year. The top 10 are dominated by retailers, however, with the Gap and the Limited on the list with Wal-Mart. The common denominator among the top firms is that they are leanly run companies that have positioned themselves as leaders in fast-growing market niches.

The report also focuses on each grade separately. Companies beyond Wal-Mart that scored best in executive pay, for example, were Food Lion, a grocery chain based in the Southeast; Berkshire Hathaway, an investment conglomerate whose chairman is investor extraordinaire Warren Buffett, currently serving as head of Salomon Brothers; Stewart & Stevenson, which makes diesel and gas-turbine engines, and Hannaford Bros., the largest grocer in Northern New England. Time Warner was dead last, done in by gargantuan rewards to Chairman Steven Ross and other executives. Last week, the media company's well-remunerated president, Nicholas J. Nicholas Jr., was forced out by the board. He apparently failed to win a power struggle with Ross, who last year epitomized the overpaid CEO with an overall compensation package of almost $80 million. Athletic-shoe manufacturer Reebok International; Legent Corp., which makes software; Freeport McMoran, a mining and energy company, and Chris-Craft Industries, a diversified broadcasting firm, get marks almost as black.

The highest grade for management ownership—based on the CEO's share holdings as a percentage of actual compensation—goes to Lawter International, a maker of printing ink and pigments. Berkshire Hathaway again scored high, followed by software giant Microsoft; Nike, the athletic-shoe maker, and retailer Petrie Stores.

A company scores higher in shareholder accountability if, for example, it eschews rules that entrench existing management, like antitakeover measures. Bear Stearns, the Wall Street brokerage, is first here for the second successive year. But most companies don't get high marks. Only 74 have adopted confidential shareholder voting procedures for corporate elections. And over half have lucrative severance packages for executives. Among the beneficiaries: Time Warner's just departed Nicholas. ■

*Included with $50 annual membership in United Shareholders Association (1667 K Street, N.W., Suite 770, Washington, DC 20006).

stryker

Fact Book 1991-1992

DAVID J. SIMPSON
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Chief Financial Officer
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1/92

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1991 Results
Year Ended December 31

	1991	1990	% Increase
Net Sales	$364,825	$280,634	30
Earnings Before Income Taxes and Extraordinary Item	53,345	38,100	40
Net Earnings Before Extraordinary Item	33,075	23,625	40
Extraordinary Gain		9,910	
Net Earnings	33,075	33,535	
Net Earnings per Share:			
Before Extraordinary Item	.70	.50	40
Extraordinary Gain		.21	
Net Earnings	.70	.71	
Dividends per Share	.05	NA	
Return on Sales*	9.0%	8.4%	
Return on Equity*	20.0%	18.2%	

*Excludes extraordinary gain
$ in thousands (except Earnings per Share)

Notes:

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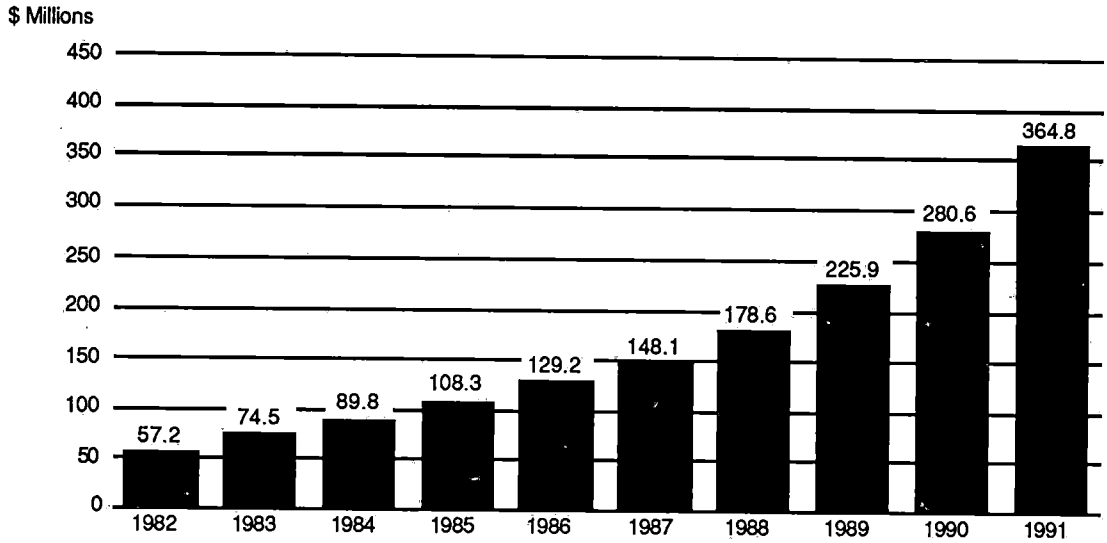
Net Sales

Compound Annual Growth Rate 24%



Notes:

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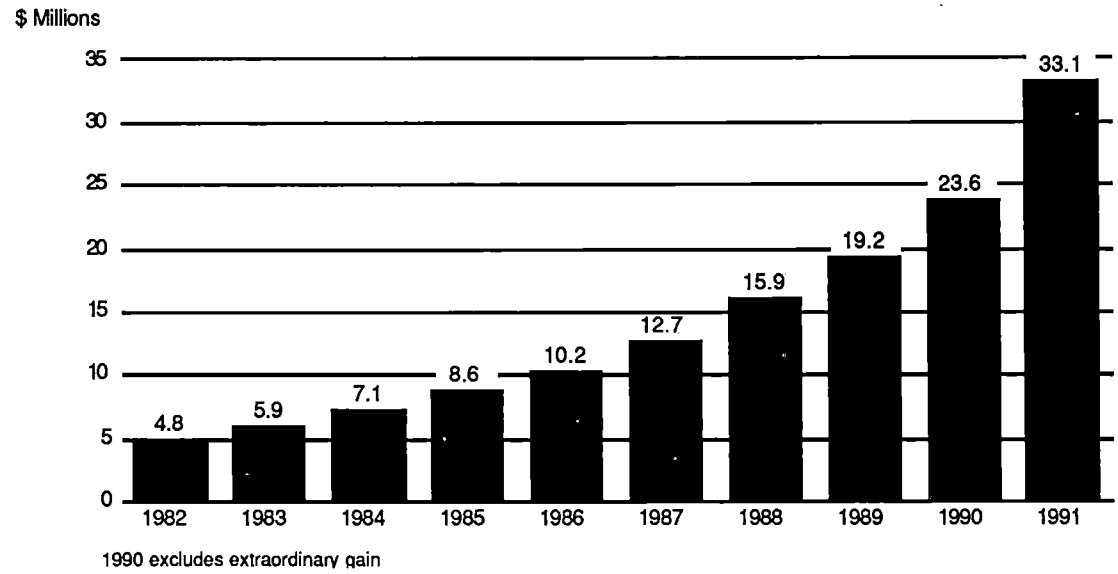
Net Earnings

Compound Annual Growth Rate 24%



1990 excludes extraordinary gain

Notes:

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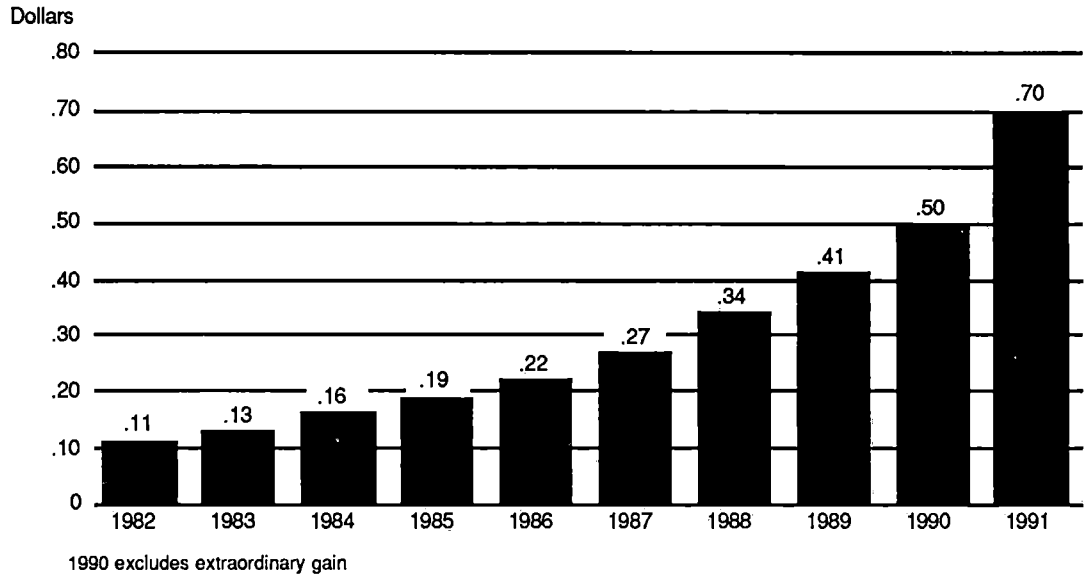
Net Earnings per Share
Compound Annual Growth Rate 23%



1990 excludes extraordinary gain

Notes:

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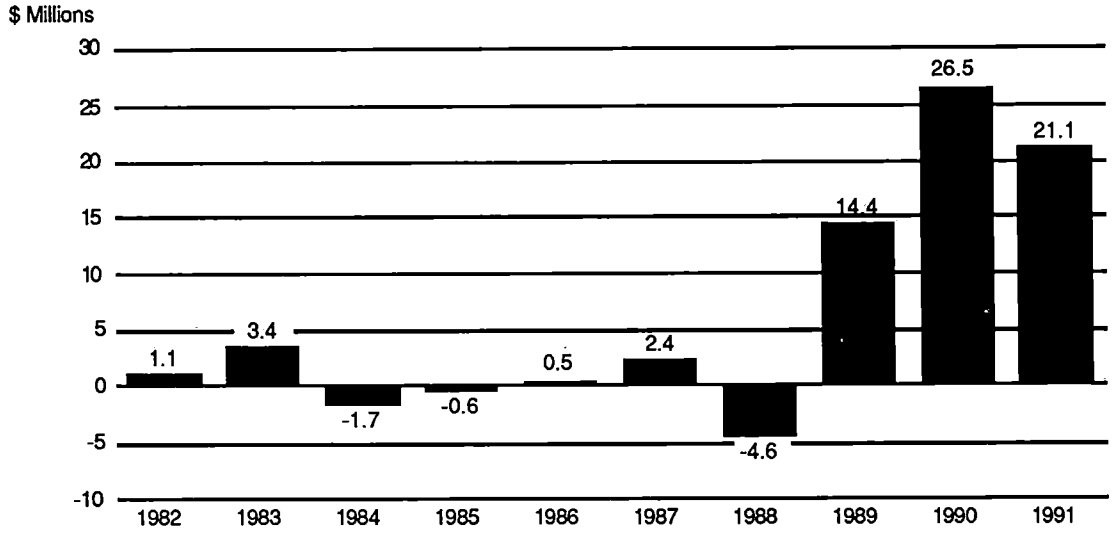
Cash Flow from Operations



Cash flow from Operations is net of capital spending

Notes:

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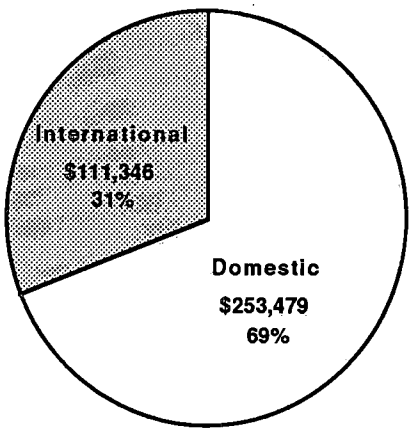
Domestic/International Sales – 1991
($ Thousands)



Total $364,825

Notes:

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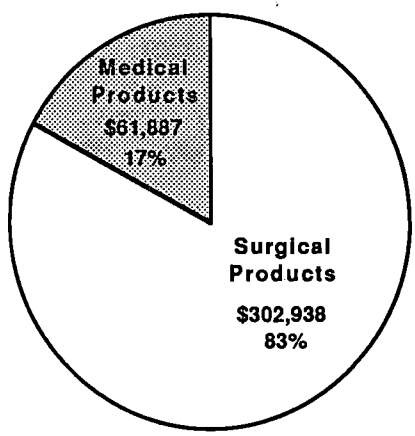
Product Line Sales – 1991

($ Thousands)



Total $364,825

Notes:

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John W. Brown
Chairman, President & Chief Executive Officer

Jason T. Blackwood	President, Physiotherapy Associates
Jean-Pierre Boucher	President, Stryker Europe
Harry E. Carmitchel	President, Medical
Ronald A. Elenbaas	President, Endoscopy and Instruments
William T. Laube	President, Stryker Pacific
Edward B. Lipes	President, Osteonics Corp.
David J. Simpson	Vice President & Chief Financial Officer
Thomas R. Winkel	Vice President of Administration General Manager, Americas/Middle East
Samuel Yin	Director, Stryker Biotech

Notes:

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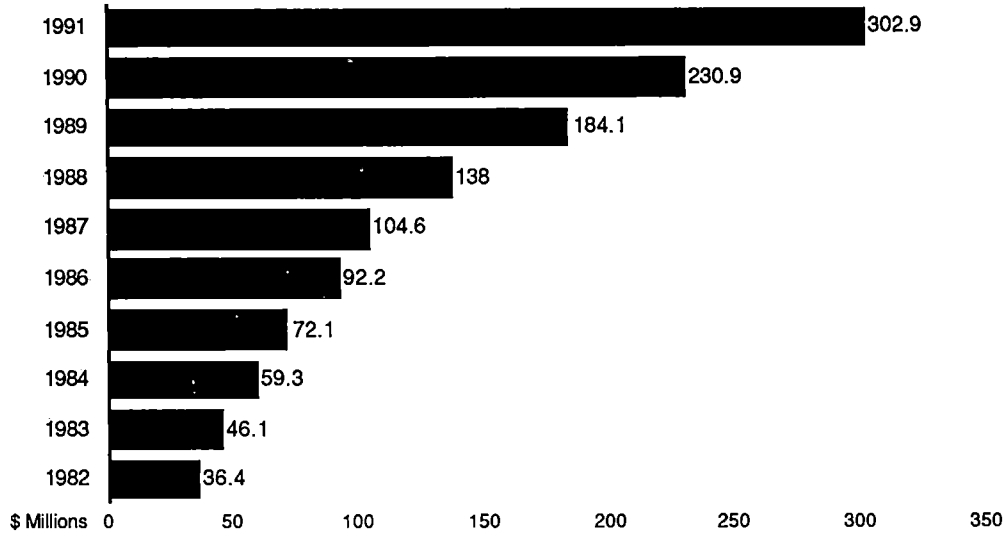
Surgical Product – Sales

(Orthopaedic Implants, Endoscopic Systems, Powered Surgical Instruments, and Other Surgical Devices)

Compound Growth Rate = 27%



Notes:

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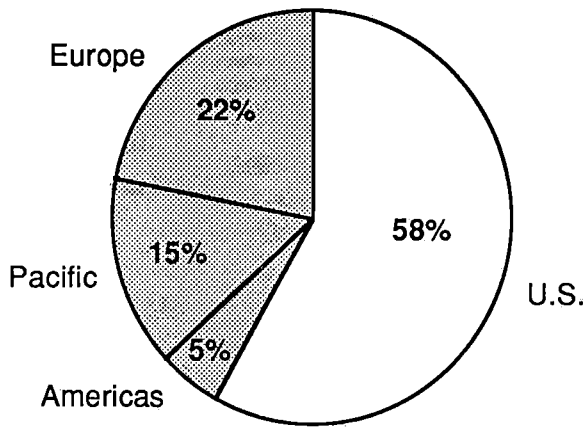
Worldwide Orthopaedic Market

$4.5 Billion – 1991



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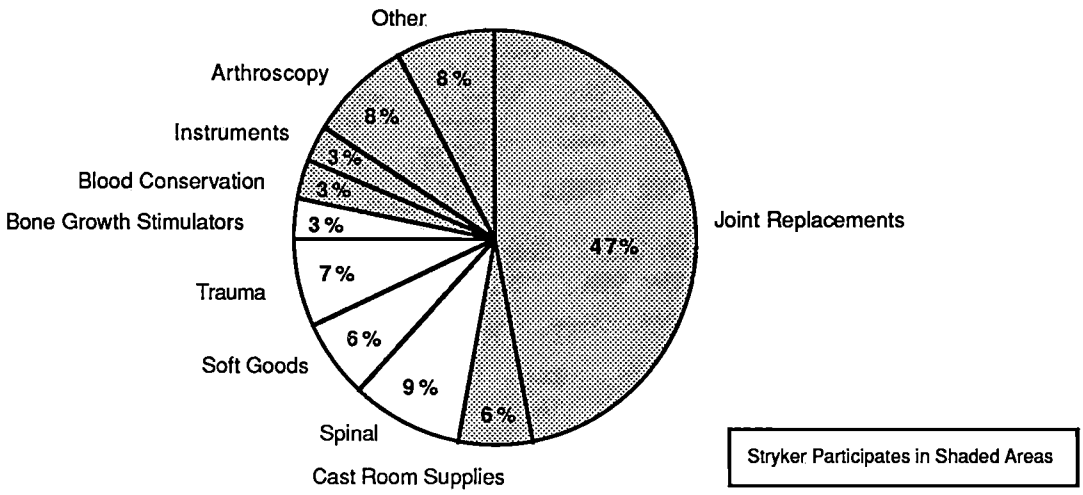
Orthopaedic Market – U.S.

$2.6 Billion – 1991



Notes:

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Orthopaedic Reconstructive Products

U.S. Market – 1991

Implant Type	Unit Sales (000s)	Sales ($ Millions)
Hip Implants	225	$ 650
Knee Implants	160	550
Other Joint Implants		50
Total Reconstructive Products		$1,250
Growth Rates		
Hip Implants	5%	10%
Knee Implants	10%	18%
Total Reconstructive Products	7%	13%

Notes:

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Hip Implants
U.S. Market – 1991

Implant Type	Typical Price	Unit Sales (000s)	Sales ($ Millions)
Stem Component			
Porous/HA	$2,450	90	$225
Conventional	1,600	90	145
Total		180	370
Acetabular Component			
Fixed	1,050	120	130
Universal	625	60	40
Total		180	170
Endoprostheses	450	45	20
Other			90
Total Hip Implants		225	$650

Notes:

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Knee Implants
U.S. Market – 1991

Implant Type	Typical Price	Unit Sales (000s)	Sales ($ Millions)
Porous/HA	$3,600	80	$280
Conventional	2,800	55	160
Unicondylar	1,750	25	40
Other			70
Total Knee Implants		160	$550

Notes:

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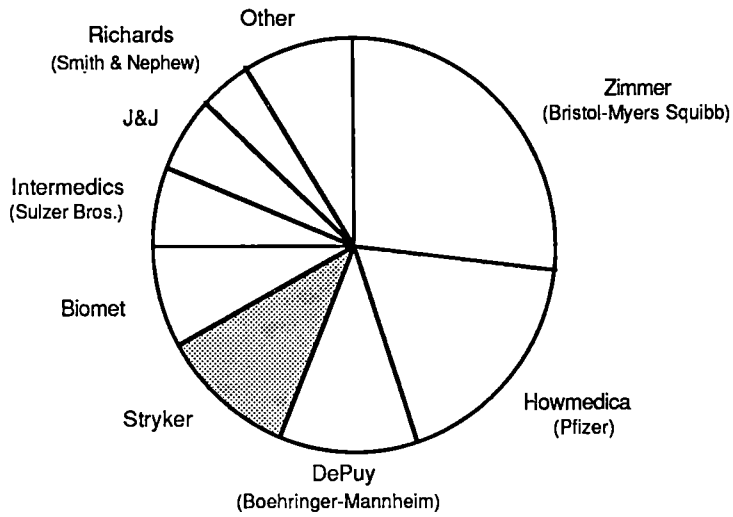
Orthopaedic Reconstructive Products

U.S. Market Shares – 1991

Market Size: $1,250,000

$ Growth Rate: 13%



Notes:

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Instruments
1991

Product Line	Typical Selling Price	Market Size ($ Millions)	$ Growth
Heavy Duty Powered Instruments	$17,000	$ 45	6%
Micro Powered Instruments	12,000	50	8
Lavage/Wound Irrigation	2,500	15	6
Wound Drainage/Blood Reinfusion	4,000	80	28
Bone Cement Mixers and Applicators	2,500	25	8
Dental Systems	4,300	110	15
Other		25	4
Total		$350	14%

Notes:

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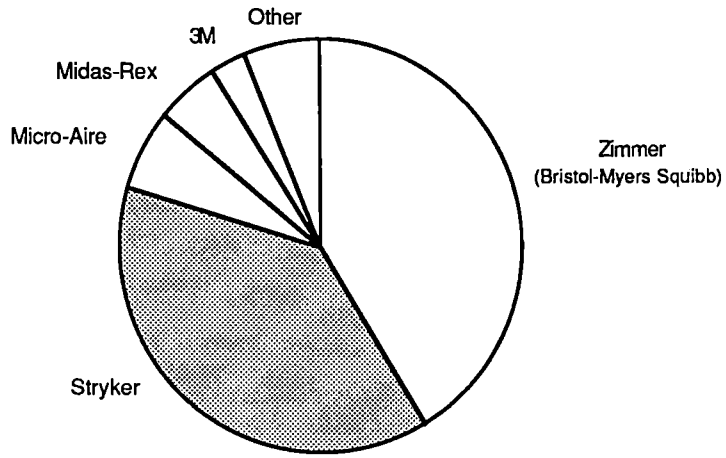
Powered Surgical Instruments – U.S.

U.S. Market Shares – 1991

Market Size: $95,000,000

$ Growth Rate: 7%



Notes:

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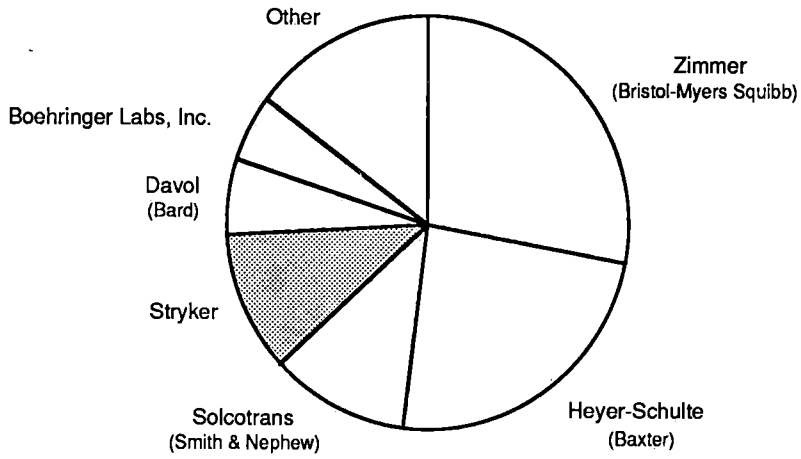
Wound Drainage/ Post-Op Blood Reinfusion

U.S. Market Shares – 1991

Market Size: $80,000,000

$ Growth Rate: 28%



Notes:

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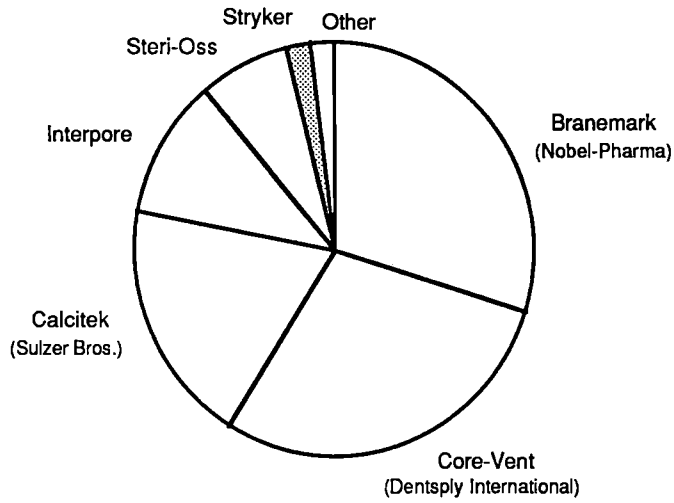
Dental Implant Systems
U.S. Market Shares – 1991

Market Size: $110,000,000

$ Growth Rate: 15%



Notes:

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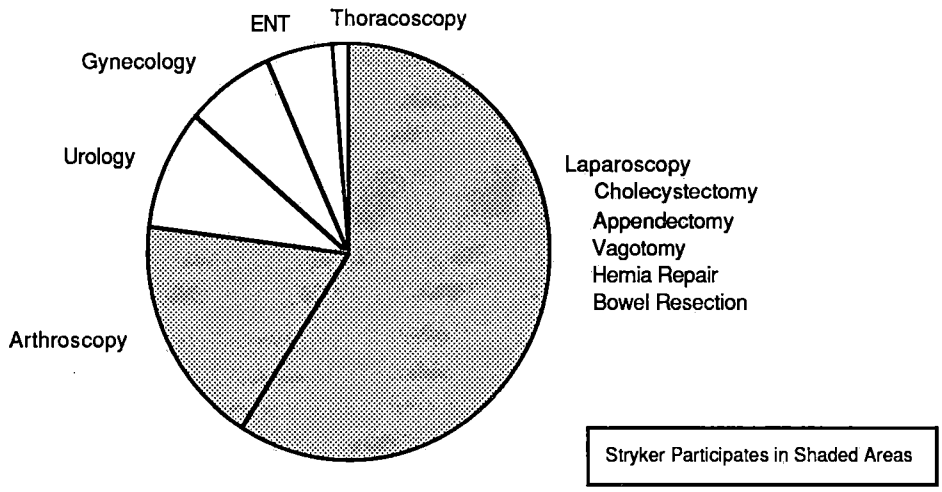
Rigid Endoscopy Market – U.S.

$1.1 Billion – 1991



Notes:

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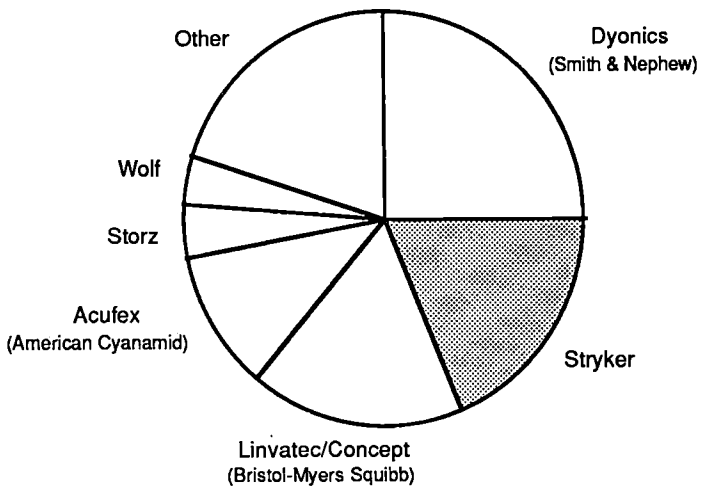
Arthroscopy
U.S. Market Shares – 1991

Market Size: $200,000,000

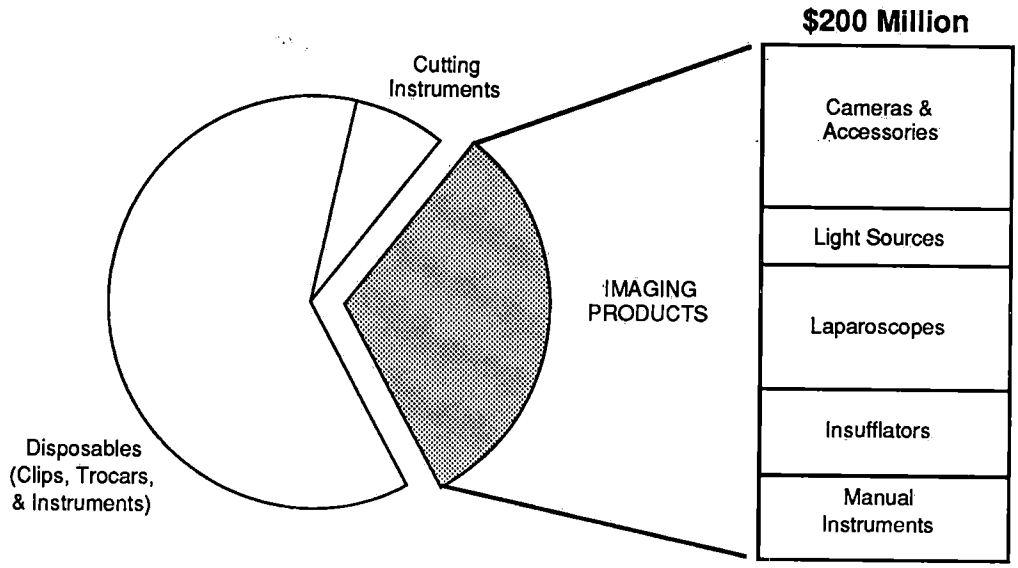
$ Growth Rate: 12%



Notes:

Laparoscopy Market – U.S.

$650 Million – 1991



Notes:

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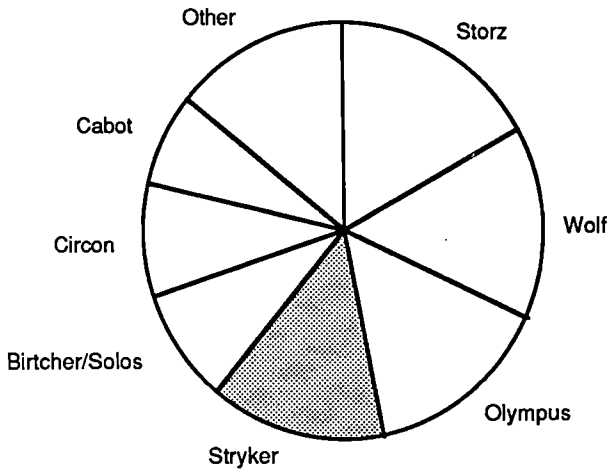
Laparoscopy Market
Imaging Products
U.S. Market Shares – 1991

Market Size: $200,000,000

$ Growth Rate: 25%



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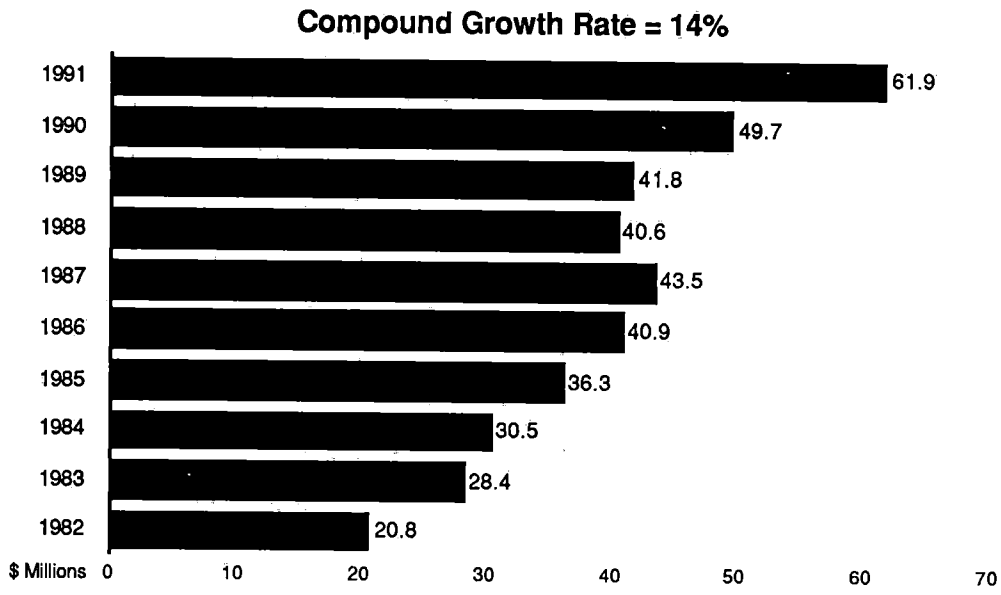
Medical Products – Sales

(Patient Handling Equipment and Physical Therapy Services)



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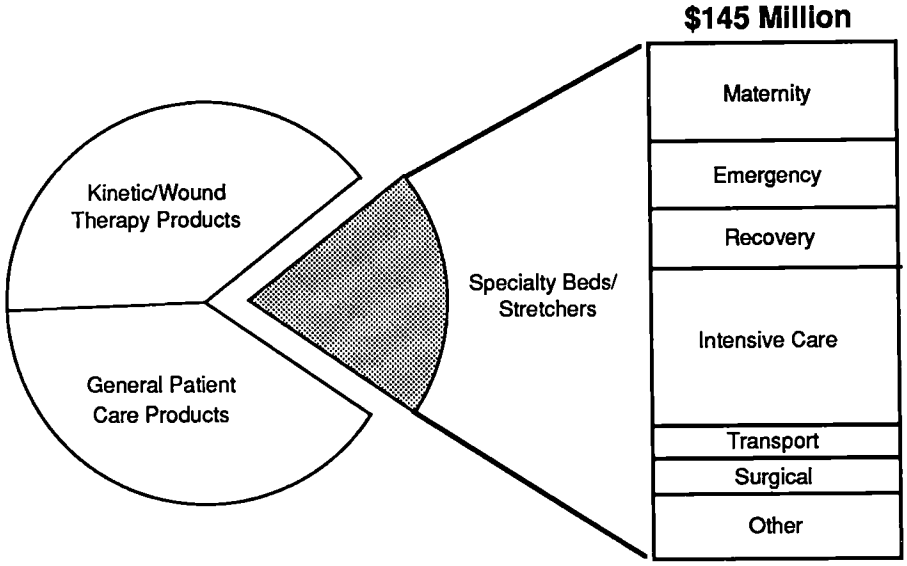
Hospital Bed Market – U.S.

$750 Million – 1991



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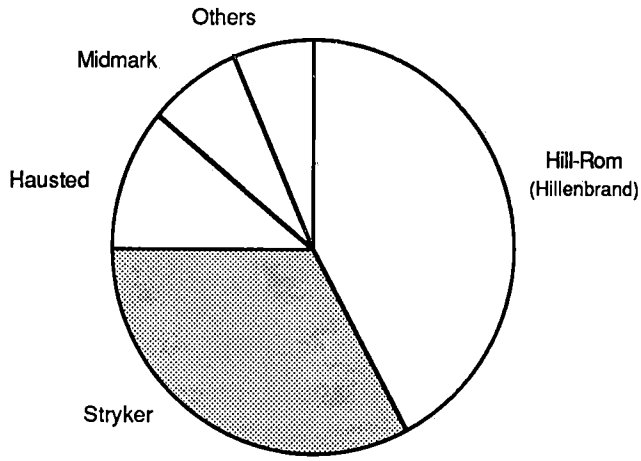
Specialty Stretcher/Bed
U.S. Market Shares – 1991

Market Size: $145,000,000

$ Growth Rate: 4%



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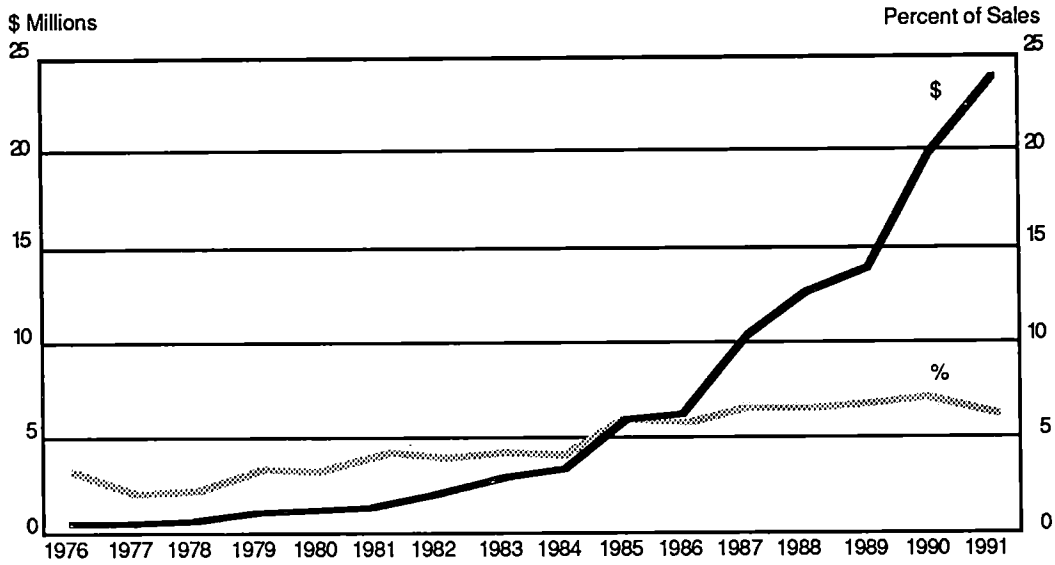
Research & Development Spending



Notes:

STRYKER CORPORATION ANNUAL REPORT 1991

Stryker Corporation

develops, manufactures

and markets specialty

surgical and medical

products, including

endoscopic systems,

orthopaedic implants,

powered surgical

instruments and patient

handling equipment

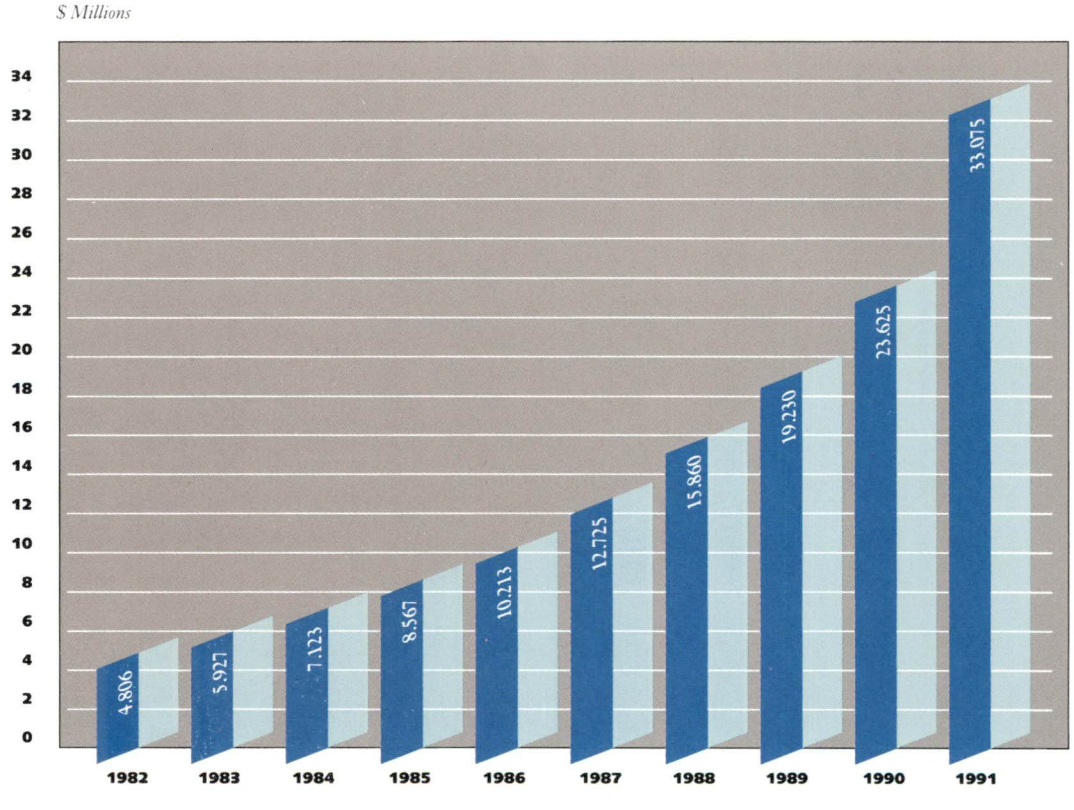
for the world market.

FINANCIAL HIGHLIGHTS

	1991	*1990*	*% Increase*
Net Sales	$364,825,000	$280,634,000	30
Earnings Before Income Taxes and Extraordinary Item	53,345,000	38,100,000	40
Earnings Before Extraordinary Item	33,075,000	23,625,000	40
Extraordinary Gain		9,910,000	
Net Earnings	33,075,000	33,535,000	–
Earnings Per Share of Common Stock:			
Before Extraordinary Item	.70	.50	40
Extraordinary Gain		.21	
Net Earnings	.70	.71	–
Average Number of Shares Outstanding	47,526,000	47,396,000	–

EARNINGS BEFORE EXTRAORDINARY ITEM

Compound Annual
Growth Rate 24%



It gives me great pleasure to report that 1991 was an excellent year for Stryker Corporation. Net sales climbed to $365 million, a 30% advance over 1990. Net earnings reached $33 million, a 40% increase over our 1990 earnings before the extraordinary gain recorded last year. On this same basis, our earnings per share of $.70 also represented a 40% increase.

In 1991, for the fifteenth consecutive year, we reached our stated goal of 20% annual growth in earnings — indeed, we outpaced it by a comfortable margin.

SURGICAL GROUP

Our Surgical Group comprises three divisions: Endoscopy, Osteonics and Instruments. All three are technology leaders, and their leadership was once again rewarded by the market in 1991, as Surgical sales advanced 31%.

Endoscopy

Stryker Endoscopy produces high-quality video cameras, scopes, light sources and instruments for use in less-invasive surgical procedures. This division initially focused exclusively on arthroscopy equipment for the orthopaedic surgeon operating on the knee, and it continues to play a leading role in this market. But in the past two years, Endoscopy has successfully broadened its focus to include laparoscopic equipment for the general surgeon.

The market for laparoscopic equipment grew at a truly explosive pace during 1991, as a great many general surgeons learned and applied innovative, less-invasive techniques. Already, of the 550,000 cholecystectomies (gall bladder removals) performed in the U.S. in 1991, over half were less-invasive procedures.

Stryker was in an excellent position to participate in the new laparoscopic cholecystectomy market. Because of our arthroscopy business, we already supplied the only medical video system on the market to deliver a broadcast-quality image. The resolution and color clarity of our 777 3-Chip Camera remain unrivaled to this day.

For several reasons, we anticipate continued growth in the endoscopy market. First, less-invasive techniques are gaining acceptance for a considerable number of surgical procedures — a number that will grow as medical technology continues to evolve. Second, growth is likely to be patient-driven: patients will demand a procedure that gets them back to normal life in a matter of days rather

than open surgery that entails a long, uncomfortable period of recuperation. Finally, growth in this market is already global in scope.

We expect the general endoscopy market to evolve in the 1990s much as the arthroscopy market did in the last decade. The entry of numerous suppliers will result in excess capacity and, ultimately, a market consolidation. We know how to prevail under these conditions. As in the past, our keys to success in the 1990s will be keeping our technological lead and staying market focused.

Osteonics

Orthopaedic implants from Osteonics registered solid sales growth in 1991.

Hydroxylapatite (HA) was one of the most exciting stories of 1991. During the year we launched the first HA-coated hip stem to be released commercially in the U.S. We believe that surface treatment with hydroxylapatite will prove to be a major stride toward faster patient rehabilitation and improved implant longevity. Following the receipt of FDA permission late in 1990, we first released HA on our Omnifit hip stem. In mid-1991 we received FDA permission to release HA on our Omniflex hip, which is the state-of-the-art prosthesis for younger and more active patients. We launched the HA-coated Omniflex hip in September.

During 1991, Osteonics also introduced a low friction ion treatment (LFIT) for the cobalt chrome bearing surfaces of both hip and knee implants. Polyethylene wear debris is believed to be a major cause of implant loosening. LFIT technology decreases the friction between the cobalt chrome and polyethylene components of an implant, thereby reducing polyethylene wear.

In 1991 Osteonics also introduced a new hip stem that is designed specifically for revision surgery.

Instruments

This division produces top-of-the-line surgical instruments such as bone saws and drills, as well as other operating room equipment for use in orthopaedic surgery.

The CBC-ConstaVac Blood Conservation System continued to be a great success for Stryker Instruments in 1991. This system collects blood lost after joint replacement surgery and makes it available for reinfusion in the patient.

Stryker Instruments also realized substantial growth in the sale of battery-powered heavy-duty surgical instruments. Its latest generation of these products, System 2000, rapidly gained favor with surgeons around the world.

MEDICAL GROUP

I am especially pleased to report the turnaround at Stryker Medical, which produces specialty beds and stretchers. After several years of rethinking and retooling, this division is once more contributing to Stryker's overall growth. Our stretcher sales were up sharply in 1991, as numerous hospitals turned to Stryker for our Renaissance Series products, which were introduced in the last two years.

Medical Group sales, which include results of our Physiotherapy Associates subsidiary, increased 25% in 1991.

INTERNATIONAL

Stryker's strong sales organizations in the Pacific, Europe and the Americas distribute our products in every one of the world's markets. International sales volume increased 35% in 1991 and accounted for 31% of our overall sales for the year, as compared to 29% in 1990. We are gradually nearing the day when our international sales volume will equal our domestic sales.

Japan is our largest market outside the U.S. In 1991 we were pleased to extend our long-standing relationship with Matsumoto Medical Instruments, Inc., which is the largest distributor of medical devices in Japan. As well as being our largest customer, Matsumoto has truly become our business partner. This relationship has helped make Stryker the leading hip implant company in Japan, and I am especially pleased that Matsumoto began distributing our knee implants in Japan on January 1, 1992.

In Europe, the creation of a dedicated sales force for endoscopy products has helped us achieve substantial growth in sales. Our Osteonics line continued to sell very well in Europe. In France, which has been a very strong market for Osteonics products, we released our HA-coated knee implant during 1991. We are concerned, however, about forthcoming price limitations in the French implant market. In Italy, where we were already a market leader, the successful launch of our electric heavy-duty powered instruments led to further gains.

Stryker Americas had an excellent year. In Canada, our direct sales force is gaining momentum in penetrating the hip and knee implant markets as well as in expanding sales of our instruments, endoscopy and medical product lines. Throughout Latin America, and especially in Mexico and Puerto Rico, our Osteonics and endoscopic systems continue to be well received in these extremely cost-conscious markets.

SAPLINGS AND SEEDLINGS

We have gone to some lengths to make sure that, like a healthy forest, Stryker Corporation always has a good mix of saplings and seedlings growing up among its taller trees. Physiotherapy Associates is one of our sturdier saplings. This organization now comprises 27 physical therapy clinics located primarily in the Southeast. The clinics focus on returning patients to work and play following injury or orthopaedic surgery.

Our dental implant business is growing fast. In terms of fixation and comfort, dental implants are a great improvement over dentures. Stryker Instruments is a leading producer of low-speed drills for oral surgeons. In 1990 we acquired a high-quality system of dental implants that we had already been marketing in conjunction with our drills. In 1991 we increased our dedicated dental implant sales force by 30%.

Finally, I am delighted to report the 1991 formation of our newest division, Stryker Biotech, and the appointment of Samuel Yin, Ph.D. as its director. This new division is the outgrowth of long-term research into human osteogenic protein that has been funded by Stryker and conducted by Creative BioMolecules, Inc., a privately held biopharmaceutical company based in Hopkinton, Massachusetts. Human osteogenic protein occurs naturally in the human body and is directly implicated in a cascade of cellular events that result in bone growth.

In November 1991, the Food and Drug Administration approved an Investigational Device Exemption (IDE) for Stryker to begin human clinical trials of our Osteogenic Protein Device. This bone growth device is composed of a human recombinant osteogenic protein (OP-1) and a bioresorbable carrier to provide a scaffold for bone growth. In pre-clinical studies, the Osteogenic Protein Device has induced the formation of new bone when implanted into bone defect sites. The human clinical studies, which began in 1992, will compare the efficacy of the Osteogenic Protein Device to autografts in the repair of non-union fractures.

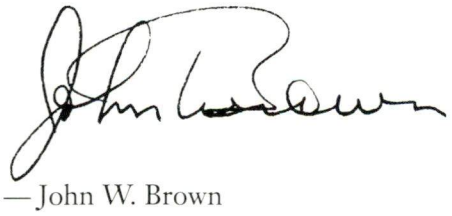
Dual Control
Critical Care Bed

LOOKING AHEAD

As the day rapidly approaches when Stryker will become a Fortune 500 company, we remain firmly committed to the principle that has brought us this far: growing big by thinking small. We are a highly decentralized company composed of small, highly focused and autonomous operating units. Our experience has confirmed that managers in small, focused teams will devote exceptional amounts of time and energy to becoming market leaders. We will retain this small-company vitality even as we grow larger as a corporation. The key is to keep our management organization as flat as possible and to split off small, independent business units as our existing divisions grow larger.

We are fortunate in having talented, ambitious people at the head of all our divisions — people who rise to great expectations. In fact, at all levels of our organization, both in the U.S. and abroad, the people of Stryker are reaching higher and achieving more.

Our belief in the future is reflected in the size of our commitment to research and development, which topped $23 million in 1991 and will be higher yet in 1992 and beyond. That is the price of leadership — a price we pay with full confidence that the medical markets will continue to show a powerful appetite for products that are innovative, cost-effective and high in quality.



— John W. Brown
Chairman, President and Chief Executive Officer

STRYKER ENDOSCOPY

The World Standard in Medical Video Systems

JUST A FEW YEARS AGO, A PATIENT AWAITING gall bladder surgery could expect a four to eight day hospital stay followed by a full month's convalescence at home. Today, thanks to a less-invasive surgical procedure known as laparoscopic cholecystectomy, this same patient can expect to go home after a day in the hospital and to return to work within a week. This procedure enables a surgeon to remove the gall bladder with just four small punctures in the abdomen. By sparing the patient the trauma and pain of a major incision, laparoscopic cholecystectomy also saves the health insurer the costs of a prolonged hospital stay and frees the employer from the burden of an extended employee absence.

The U.S. laparoscopic market reached $650 million in 1991, and it is the fastest growing market segment in which Stryker participates. Stryker's competitive edge in this market is the unmatched quality of its medical video imaging equipment. Whether it is attached to a laparoscope (for looking inside the abdomen) or to an arthroscope (for looking inside a joint), Stryker's 777 3-Chip Camera sets the world standard for sharp, natural-color images.

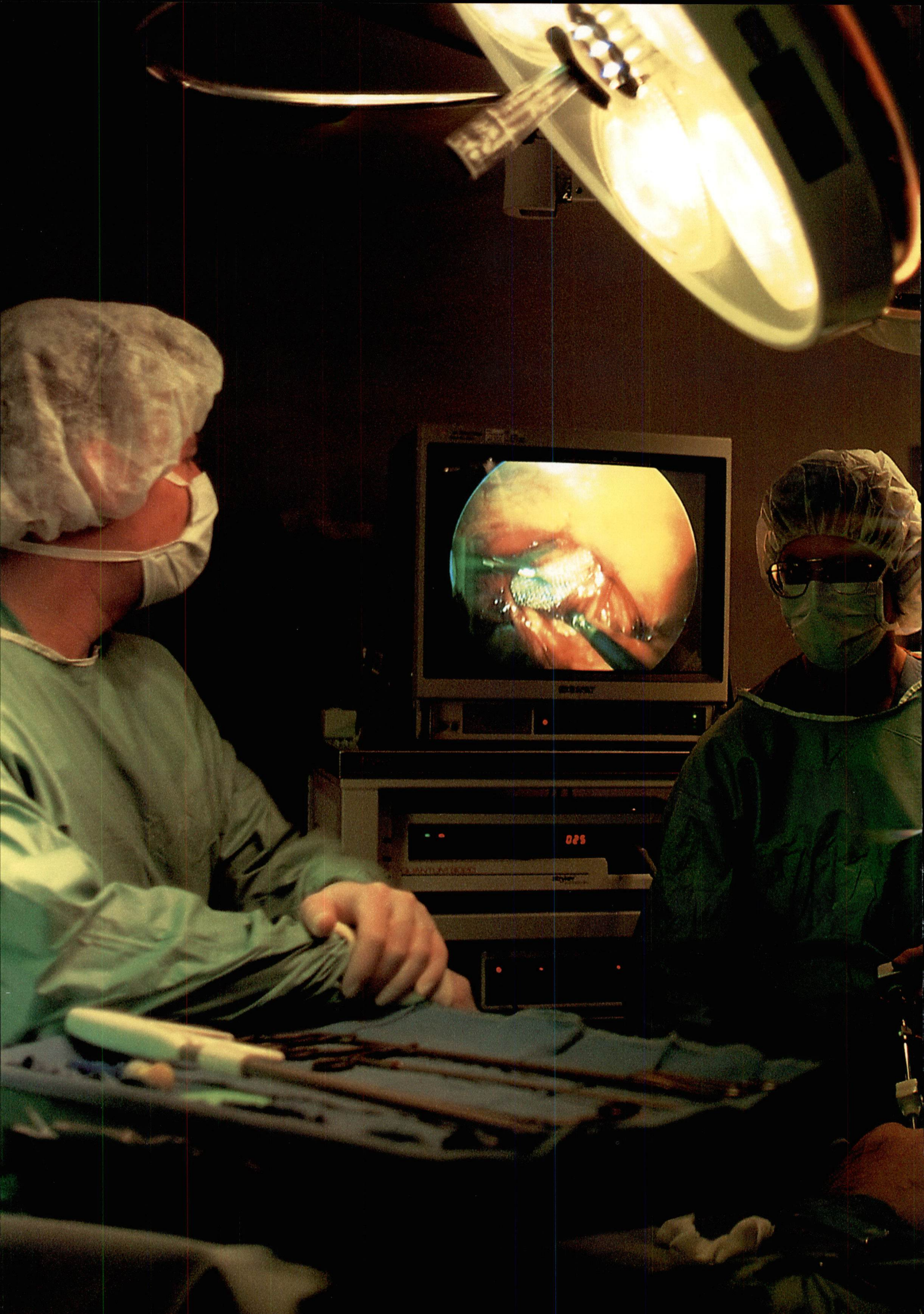
Today, laparoscopic techniques are revolutionizing general surgery just as arthroscopic techniques revolutionized knee surgery a decade ago. Less-invasive procedures for appendectomies, hernia repairs, bowel resections, hysterectomies and thoracic surgery are rapidly gaining acceptance. And while it took some five years for arthroscopic techniques to spread from the United States to other parts of the world, the spread of laparoscopy has been virtually instantaneous. Stryker has filled orders for laparoscopic equipment not only from Western Europe and Japan, but also from Taiwan, the Phillipines, Mexico, Saudi Arabia, Singapore and Poland.

While developing new customers among general surgeons, Stryker Endoscopy continues to gain share in the arthroscopy market, where its product line includes arthroscopes, powered instruments, manual instruments and light sources, as well as a range of micro-video systems. In 1991, Stryker's arthroscopy business grew at roughly twice the 12% pace of the overall arthroscopy market. The Company now ranks second in this $200 million market.

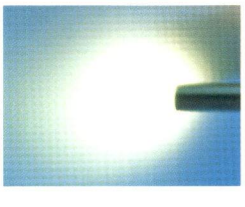
In 1991, Stryker introduced the SE4 arthroscopy power system, a fourth generation of these surgical instruments that incorporates new developments in brushless motor technology, new features and additional cutters and burs.

To keep pace with the growing demand for its products, Stryker Endoscopy doubled the size of its facility in San Jose, California and substantially enlarged its facility in Arroyo, Puerto Rico. It also boosted its sales force by more than 40% and stepped up the pace of R&D spending by 70%. With more than twice as many engineers on staff, Stryker Endoscopy is well prepared to continue its strategy of continuous incremental improvements in existing products and carefully targeted new product introductions.

stryker
ENDOSCOPY
777 MEDICAL VIDEO CAMERA
COLOR ADJUSTMENT
RED
BLUE
MANUAL
AUTO
LOCK
POWER
COLOR CONTROL
3 CCD
stryker



Shown here in use during a less-invasive hernia repair, Stryker's state-of-the-art video camera captures subtle color differences that are essential for identification of internal structures and tissues. Stryker's 777 3-Chip Camera has won an enthusiastic response from surgeons. Stryker Endoscopy also provides light sources, laparoscopes, insufflators and manual instruments for less-invasive surgery.



OSTEONICS

State-of-the-Art Orthopaedic Implants

DURING 1991, OVER 380,000 PEOPLE IN the U.S. and a comparable number in other countries underwent orthopaedic surgery for replacement of a hip or knee joint. Most of this surgery was occasioned by severe arthritis or trauma. Arthroplasty, or joint replacement, is in the mainstream of orthopaedic practice, and it has already helped millions of people on five continents to live with more mobility and less pain. In 1991, the U.S. market for reconstructive orthopaedic products grew by 13% to reach $1.25 billion. Arthroplasty is a dynamic medical specialty driven by a continuous search for devices offering greater mobility, implant longevity and patient comfort. With the population of the U.S. and other countries living longer and more active lives, this search has gained added importance.

Osteonics has long been a leader in the development of technologically superior orthopaedic implants. In 1991 Osteonics became the first company to market a hip stem in the U.S. with hydroxylapatite (HA) surface treatment. HA is a naturally occurring calcium phosphate material that demonstrates a high level of biocompatibility due to its resemblance to living bone. Osteonics conducted years of pioneering research on the orthopaedic application of HA, and it has marketed HA-coated implants in Europe for five years. On the basis of its clinical experience in both Europe and the U.S., Osteonics believes that HA has the potential to produce great improvements in implant performance.

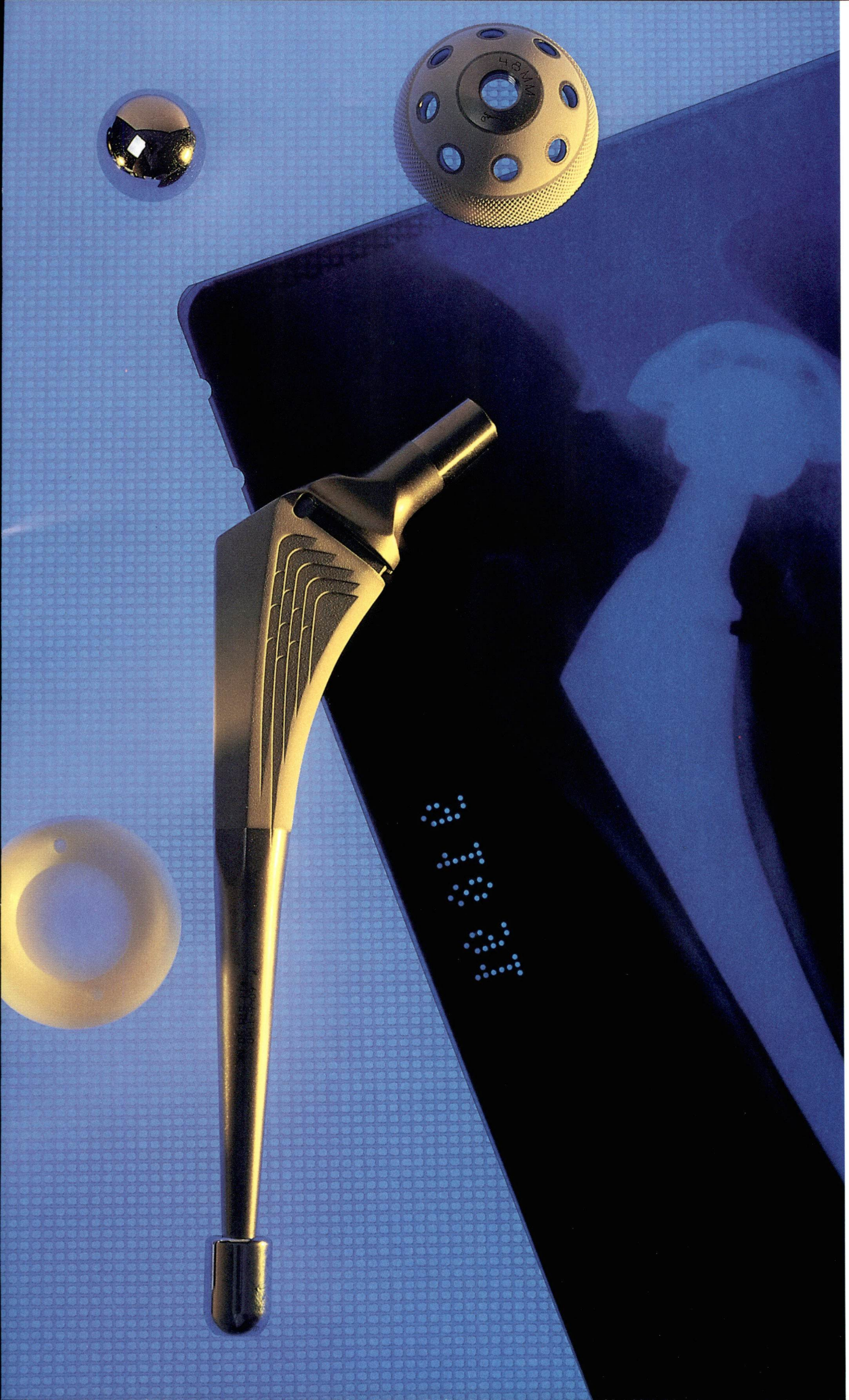
Osteonics has played a primary role in educating orthopaedic surgeons about HA, and in June 1991 it conducted the first televised symposium in its history. A panel of five surgeons and two bioengineers presented their experience with HA-coated implants to a viewing audience of 1,300 medical professionals in 61 different sites in the U.S. and Canada.

During 1991, Osteonics continued the development of a new knee implant engineered for superior fixation. Osteonics believes that this device represents a significant advance over existing designs, and that it will lead to substantial gains in clinical performance. The new knee was commercially released early in 1992. As a result of a highly streamlined process of research and development, it was launched just 18 months after conceptual work began.

International sales of Osteonics products continued to be very strong in 1991, particularly in Japan. Osteonics is in the process of releasing its CDH hip prosthesis engineered with the help of five leading Japanese universities which is specifically designed for congenital displasia of the hip prevalent in Japan.

In Europe, building on its five years of success with HA-coated hips, Osteonics completed its first full year of clinical experience with HA-coated knee implants.

During 1991, Osteonics made significant investments in its global technology base to keep pace with the growing worldwide demand for its products.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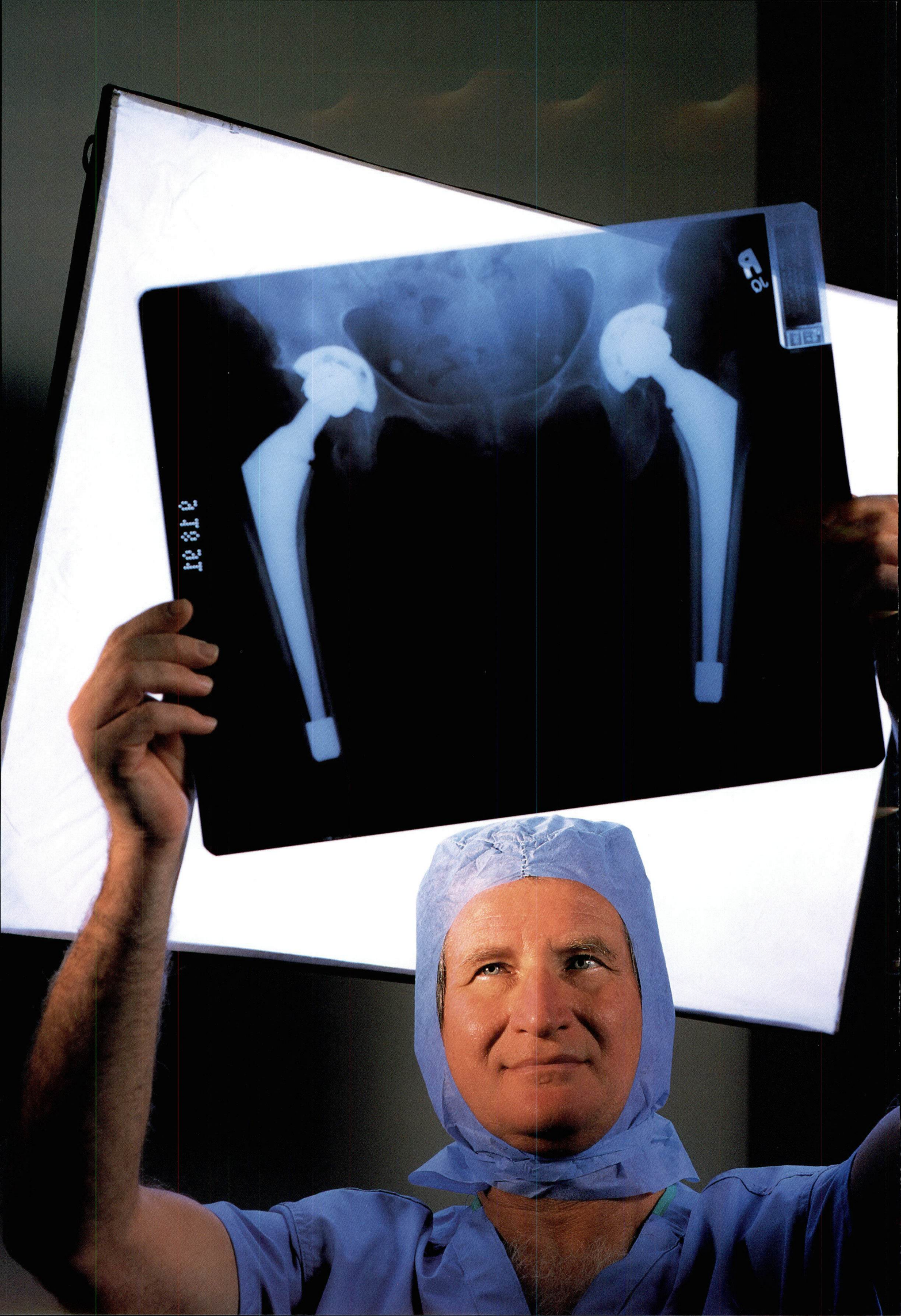
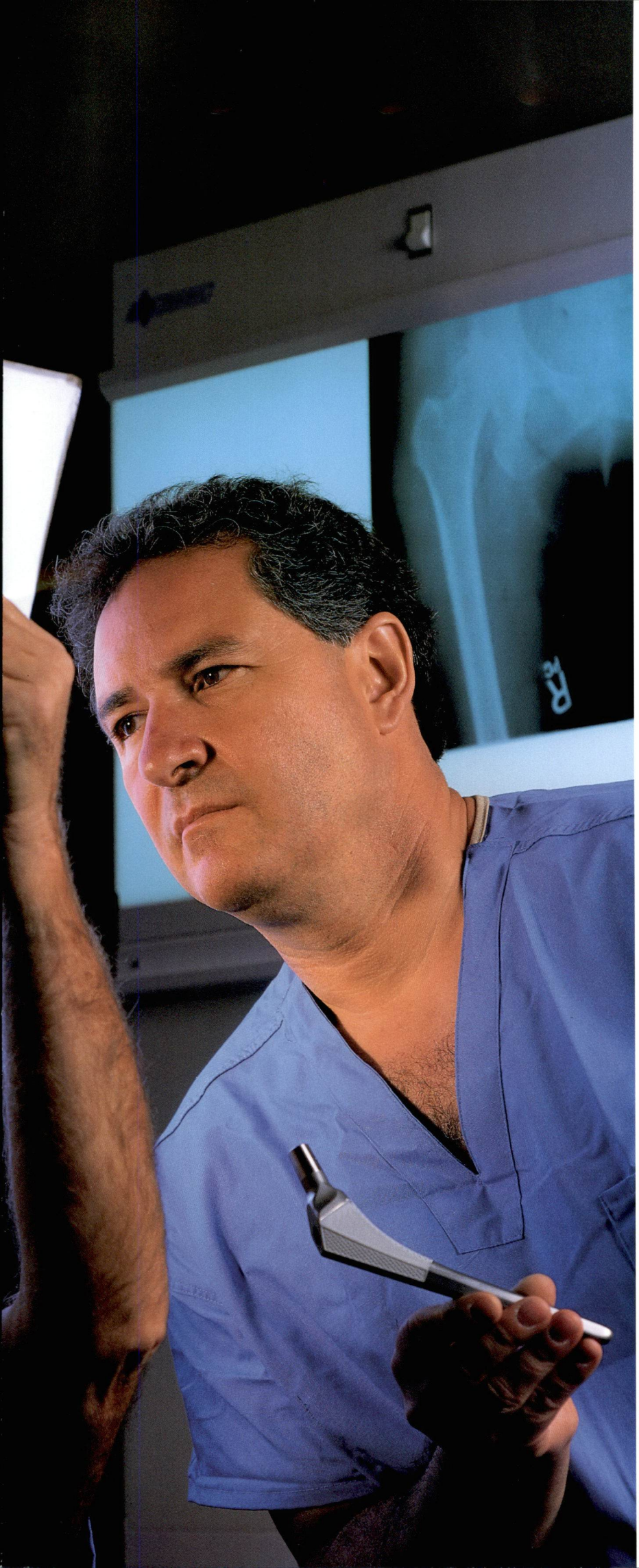
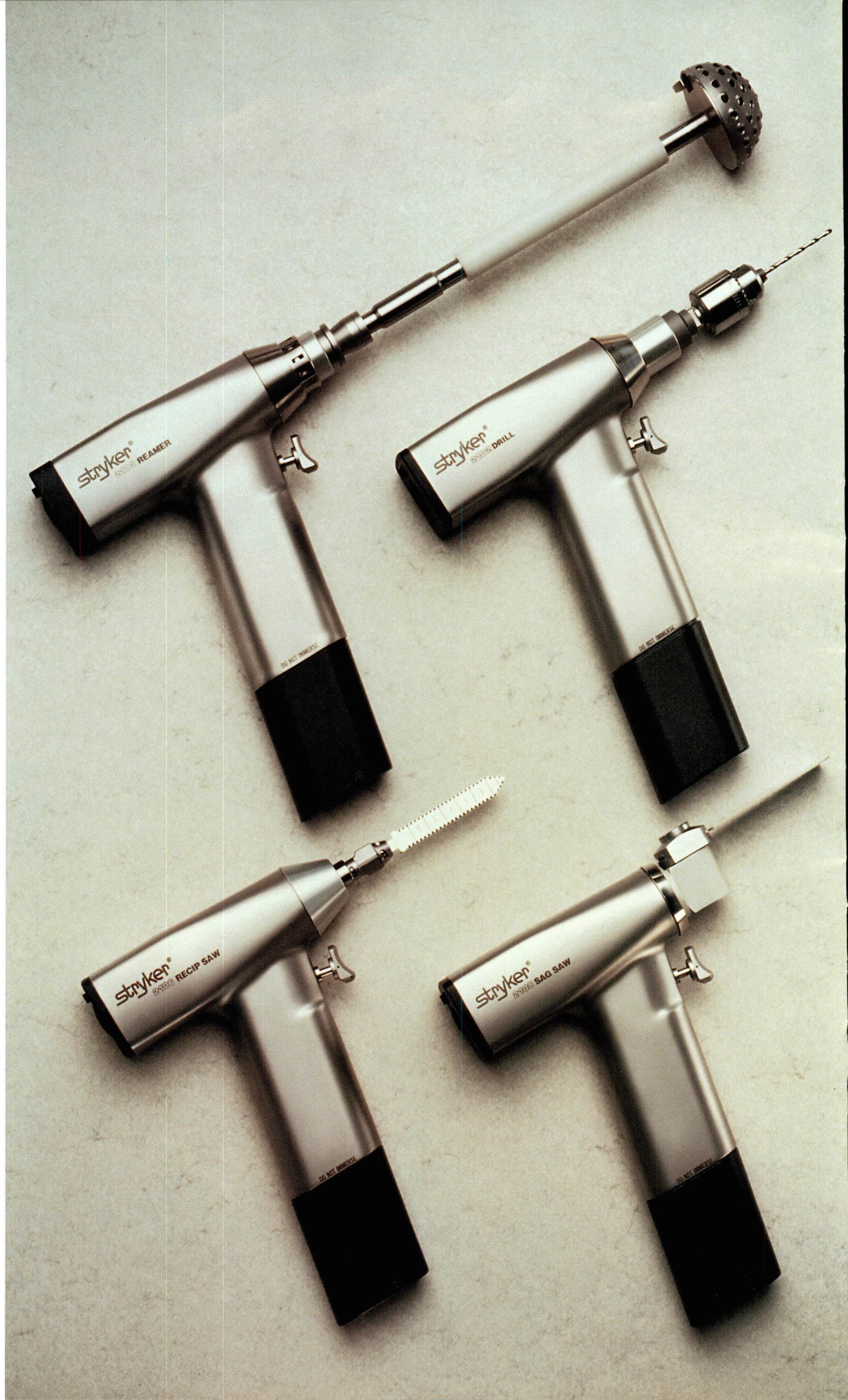




Dr. Benjamin Bierbaum of New England Baptist Hospital and Osteonics engineer Paul Serekian examine a post-operative x-ray of a patient who received bilateral Omniflex-HA hip implants. By making frequent visits to the operating room, Osteonics engineers develop a first-hand understanding of clinical issues that can be addressed through innovations in implant and instrument design.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REAMER
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RECIP SAW
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stryker
SAG SAW
DO NOT IMMERSE

STRYKER INSTRUMENTS

High-Quality Precision Instruments for a Wide-Range of Procedures

HIGH-QUALITY POWERED INSTRUMENTS IN a surgeon's hands translate into reduced time in surgery and improved clinical results for the patient. Stryker Instruments provides surgeons in specialties ranging from orthopaedics to plastic surgery to thoracic/cardiovascular surgery with a technologically superior line of powered bone saws and drills. Stryker ranks second in the $95 million U.S. market for powered surgical instruments.

Long-term research on batteries and electric motors helped Stryker develop the first successful line of battery-powered heavy-duty surgical instruments. Battery-powered instruments are highly maneuverable and eliminate the need for an additional power cord in the sterile field of the operating room. In 1991, Stryker Instruments launched System 2000, its third generation of these products. Incorporating the most sophisticated technology on the market, the new instruments are smaller, lighter, more powerful and longer-running than their predecessors. To meet its own exacting standards, Stryker produces the electric motors for these products in-house.

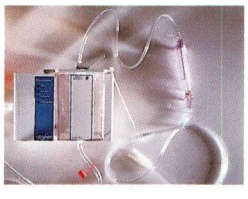
Battery-powered surgical instruments are less popular in Europe because sterilization techniques in use there would significantly shorten the life of a battery. During 1991, Stryker Instruments introduced a line of electric heavy-duty instruments designed specifically for the international markets. The first major innovation in powered instruments that these markets have seen in more than a decade, these products are the smallest, lightest and most powerful available.

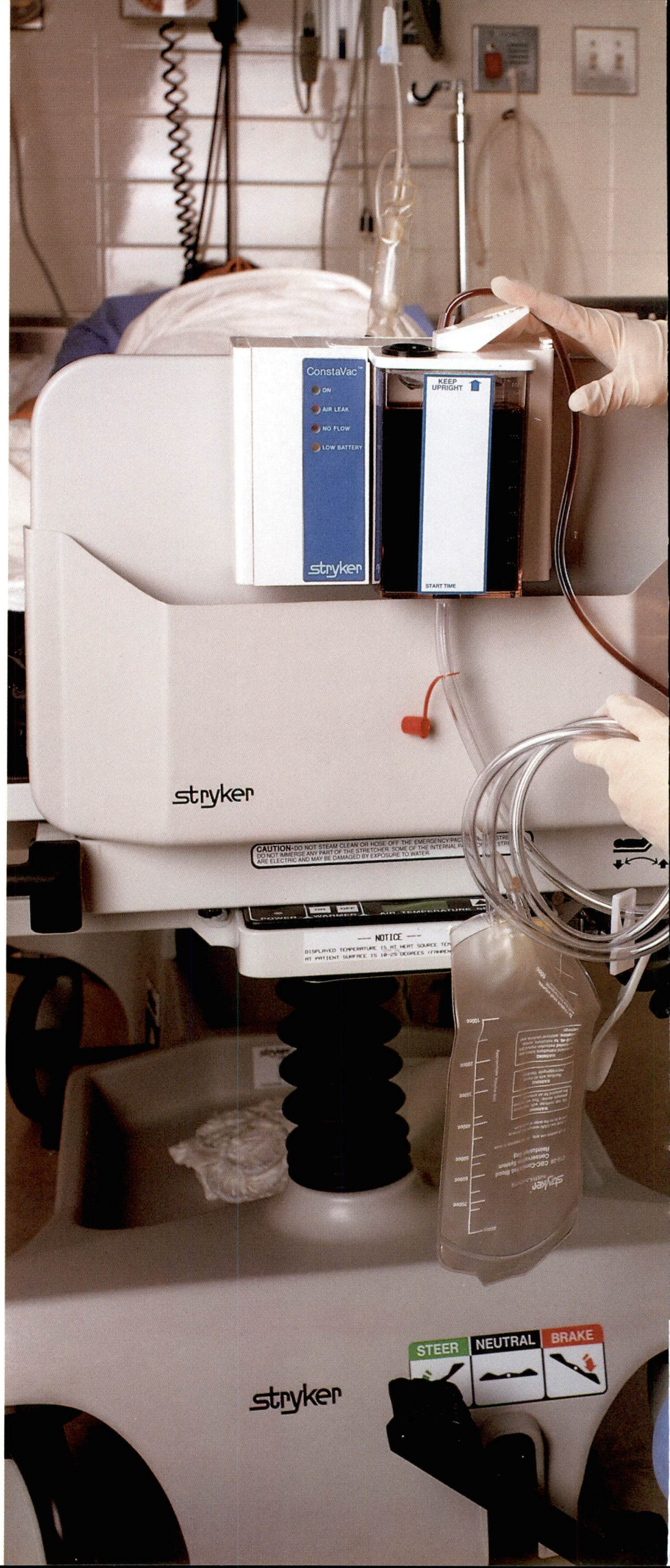
In 1991, the CBC-ConstaVac system continued to be one of Stryker Instruments' most exciting products. Following joint replacement surgery, this device drains the wound and recovers the blood for reinfusion in the patient. In many cases, CBC-ConstaVac entirely eliminates the need for banked blood. Particularly in a time of widespread concern about AIDS and other blood-borne diseases, auto-transfusion is good medicine.

The Stryker Command Microelectric System has been another continuing success. These small, light instruments give oral, plastic and hand surgeons the power, maneuverability and visibility they need to work in small areas of the body. Early in 1992, Stryker introduced its second generation of Command instruments.

During 1991, Stryker Instruments made a substantial increase in its commitment to research and development, accelerating its drive for technological advances in electric motors, gear transmissions and autoclave-resistent electronics for its next generation of products. This division also broke ground on a greatly enlarged manufacturing facility in Kalamazoo, Michigan.

In the era of AIDS and blood supply shortages, the concept of auto-transfusion has gained favor with patients and physicians alike. Utilizing simple and reliable technology, Stryker's CBC-ConstaVac system (used here by Vicky Neumann, R.N. at Borgess Medical Center in Kalamazoo, Michigan) collects the blood lost after joint replacement surgery for reinfusion into the patient. This system often minimizes or eliminates the patient's need for banked blood.





STRYKER MEDICAL

The Intelligent Choice in Specialty Beds and Stretchers

AMERICAN HOSPITALS ARE UNDER SEVERE financial pressure. With labor costs accounting for well over half their total expenditures, hospitals are seeking innovative ways to improve operating efficiency.

Stryker Medical has designed its specialty stretchers and beds to help hospitals improve their utilization of staff and space. In 1991, for example, it introduced a stretcher with on-board equipment for full-length x-ray imaging. Closely resembling a radiology table in its operation, this product saves time and minimizes patient movement in the critical first stages of trauma treatment.

Increasingly, hospitals are segregating their business by patient type. In redesigning its stretcher line over the past three years, Stryker Medical was therefore careful to tailor its products to meet specific patient needs within the hospital. In 1991, for example, it introduced a pelvic exam stretcher for the emergency room. While this product can be used for examinations or births when required, it is flexible enough to double as a regular emergency room stretcher as well.

During 1991, the Medical Division took two important steps toward better customer service. First, it expanded its sales force by 25% and split it into two teams, one dedicated exclusively to beds and the other to stretchers. This will bring additional focus to each area. Second, it more than doubled the size of its field service force. Today, Stryker is the only company in the industry to provide hospitals with dedicated field support to keep their beds and stretchers operating at peak performance.

Customers have responded to Stryker Medical's approach. The U.S. market for specialty beds/stretchers totaled $145 million in 1991, and Stryker ranked first in emergency, recovery and transport stretchers, second in maternity and intensive care unit beds, and third in surgery stretchers. While the specialty bed/stretcher market grew at approximately 4%, Stryker Medical's product sales grew by more than 20% in 1991.

Substantial investments in manufacturing and in research and development have enabled the Medical Division to achieve dramatic improvements in products and significant reductions in costs in recent years. As a result, both sales and profits have climbed. Further investments in the Medical Division can be expected to produce continuing above-market growth in the coming years.

stryker

TEN-YEAR REVIEW

(dollars in thousands, except per share amounts)

Summary of Operations	1991	1990	1989
Net Sales	$364,825	$280,634	$225,860
Costs and expenses:			
Cost of sales	172,477	132,882	106,899
Research, development and engineering	23,703	19,663	15,572
Selling, general and administrative	117,089	92,384	71,761
	313,269	244,929	194,232
Operating Income	51,556	35,705	31,628
Other income (expense)	1,789	2,395	(598)
Earnings Before Income Taxes and Extraordinary Item	53,345	38,100	31,030
Income taxes	20,270	14,475	11,800
Earnings Before Extraordinary Item	33,075	23,625	19,230
Extraordinary gain (net)		9,910	
Net Earnings	$33,075	$33,535	$19,230
Earnings Per Share of Common Stock: (A)			
Before extraordinary item	$.70	$.50	$.41
Extraordinary gain		.21	
Net Earnings	$.70	$.71	$.41
Dividend Per Share of Common Stock	$.05		
Average Number of Shares Outstanding – in thousands (A)	47,526	47,396	47,178

(A) Adjusted for the three-for-two stock splits effective August 16, 1985 and May 19, 1989; and the two for-one stock splits effective May 11, 1987 and May 13, 1991.

Financial and Statistical Data	1991	1990	1989
Cash and Marketable Securities	80,029	54,052	19,282
Working Capital	140,296	117,877	89,594
Current Ratio	2.6	3.0	3.5
Property, Plant and Equipment – Net	36,056	28,700	22,918
Capital Expenditures	16,570	11,935	7,106
Depreciation and Amortization	11,796	7,109	6,312
Total Assets	270,316	209,521	152,333
Long-Term Debt	1,400	1,900	2,655
Stockholders' Equity	179,875	147,875	112,029
Return on Average Equity	20.2	18.2	18.9
Number of Stockholders of Record	2,914	2,400	2,294
Number of Employees	2,448	1,913	1,599

1988	1987	1986	1985	1984	1983	1982
$178,636	$148,095	$129,183	$108,377	$89,779	$74,522	$57,155
85,037	71,420	64,090	54,029	44,832	37,437	28,424
12,193	8,888	6,509	5,706	3,809	3,172	2,339
55,046	45,776	39,946	33,778	28,966	24,071	18,448
152,276	126,084	110,545	93,513	77,607	64,680	49,211
26,360	22,011	18,638	14,864	12,172	9,842	7,944
(360)	14	77	473	700	683	384
26,000	22,025	18,715	15,337	12,872	10,525	8,328
10,140	9,300	8,502	6,770	5,749	4,598	3,522
15,860	12,725	10,213	8,567	7,123	5,927	4,806
$15,860	$12,725	$10,213	$8,567	$7,123	$5,927	$4,806
$.34	$.27	$.22	$.19	$.15	$.13	$.11
$.34	$.27	$.22	$.19	$.15	$.13	$.11
46,864	46,734	46,410	46,146	45,972	45,762	45,216

1988	1987	1986	1985	1984	1983	1982
4,602	5,999	8,390	12,163	11,032	10,460	6,875
70,071	56,399	43,538	37,970	31,202	23,563	18,343
3.4	3.3	2.9	3.0	3.2	3.1	3.1
20,703	17,658	17,018	14,689	10,156	7,599	6,678
7,987	3,895	5,377	6,818	4,468	2,425	3,084
5,999	5,402	3,860	3,068	1,987	1,685	1,271
124,830	104,965	89,323	73,448	58,901	44,282	35,777
3,121	3,704	3,951	4,242	3,652	72	252
91,019	75,216	60,455	49,131	40,151	32,676	26,498
19.1	18.8	18.6	19.2	19.6	20.0	20.6
2,049	2,055	1,626	1,427	1,450	1,382	1,209
1,408	1,180	1,073	948	789	722	618

Results of Operations

The table below outlines the components of the consolidated statement of earnings as a percentage of net sales:

	Percentage of Net Sales			Percentage Increase	
	1991	1990	1989	1991/90	1990/89
Net Sales	100.0%	100.0%	100.0%	30%	24%
Cost of sales	47.3	47.4	47.3	30	24
Research, development and engineering expense	6.5	7.0	6.9	21	26
Selling, general and administrative expense	32.1	32.9	31.8	27	29
Operating Income	14.1	12.7	14.0	44	13
Other income (expense)	.5	.9	(.3)		
Earnings Before Income Taxes and Extraordinary Item	14.6	13.6	13.7	40	23
Income taxes	5.5	5.2	5.2	40	23
Earnings Before Extraordinary Item	9.1	8.4	8.5	40	23
Extraordinary gain		3.5			
Net Earnings	9.1%	11.9%	8.5%		

1991 Compared to 1990

Stryker Corporation's net sales increased 30% in 1991 to $364.8 million as demand for the Company's products, which are sold to hospitals throughout the world, continued to grow. Increased unit volume generated a 26% sales increase, higher selling prices added another 5% and changes in foreign currency exchange rates reduced sales by 1%. Overall, domestic sales increased 28% and international sales grew 35%. Strong demand for Stryker Endoscopy's Model 777 3-Chip Camera and laparoscopic equipment for use in less-invasive surgery led the 31% increase in Surgical product sales, along with sales gains in powered surgical instruments and Osteonics orthopaedic implants. Sales of Medical products (principally specialty stretchers/beds) increased 25%, with gains across the entire product line.

Cost of sales increased in 1991 at the same rate as sales. Research, development and engineering expense increased 21% as the Company invested $23.7 million in 1991 compared to $19.7 million in 1990. This commitment to product development resulted in several new products in 1991 such as System 2000, the Company's third generation battery-powered heavy-duty surgical instruments, and Omniflex-HA, the Company's second hip implant system with hydroxylapatite surface treatment. Selling, general and administrative expense increased 27% in 1991, principally as a result of the increased cost of larger sales forces in the Endoscopy, Instruments and Medical Divisions, as well as increased marketing costs in the Company's Osteonics, Europe, Pacific and Americas Divisions. The percentage increase in these costs was less than the increase in sales and thus, these costs dropped to 32.1% of sales in 1991 compared to 32.9% in 1990.

Interest income, which is included in other income (expense), increased significantly in 1991 as a result of increased levels of cash and marketable securities. However, total other income decreased in 1991 as a result of $898,000 of foreign

currency losses compared to $564,000 of foreign currency gains in 1990.

The effective tax rate remained constant at 38.0% in 1991. Net earnings in 1991 were $33.1 million, a 40% increase over the Company's earnings in 1990 of $23.6 million before the $9.9 million extraordinary gain in 1990 which increased net earnings for that year to $33.5 million.

In the fourth quarter of 1991, net sales reached a record level of $100.6 million and net earnings were $10.4 million or 10.3% of sales. Fourth quarter net earnings as a percent of sales was higher than the previous three quarters of the year because selling, general and administrative expense increased at a lower rate than sales.

1990 Compared to 1989

Net sales increased 24% to $280.6 million in 1990, including a 21% increase in domestic sales and a 34% increase in international sales. Increased unit volume generated an 18% sales increase, increased prices added 4% and a 2% increase was due to changes in foreign currency exchange rates. Surgical product sales increased 25%, led by gains in sales of Osteonics orthopaedic implants, endoscopic systems and powered surgical instruments. Sales of Medical products increased 19%, with sales gains across the entire product line.

The cost of sales ratio in 1990 was consistent with the ratio in 1989. Research, development and engineering expense was 7.0% of sales and increased 26% in 1990 reflecting the Company's emphasis on new product innovation in each of the manufacturing divisions. Selling, general and administrative costs increased 29% in 1990 reflecting the increased cost of larger domestic and international sales organizations and growth in sales expenses relating to the Company's increased sales.

The change in other income (expense) for the year is a result of foreign currency gains in 1990 compared to foreign currency losses in 1989. In addition, interest income increased significantly in 1990 as a result of increased levels of cash and marketable securities.

The effective tax rate remained constant at 38.0% in 1990. Net earnings in 1990 include an extraordinary gain of $9.9 million (after income taxes of $6.1 million) relating to the settlement of long-standing patent litigation with Zimmer, Inc.

Liquidity and Capital Resources

Stryker's financial position continued to strengthen in 1991, with operating activities providing $37.6 million in cash. Working capital increased to $140.3 million from $117.9 million in the prior year. Compared with the Company's 30% increase in sales, accounts receivable increased only 5% and days sales outstanding in accounts receivable decreased to 55 days at the end of 1991 from 61 days at the end of 1990. Inventories increased 30% in 1991, principally resulting from the overall growth in the Company's business activity in the current year. Days in inventory at the end of 1991 remained virtually unchanged from the prior year end at 162 days.

The Company's cash and marketable securities of $80.0 million at December 31, 1991, as well as anticipated cash flows from operations, are expected to be sufficient to fund planned future operating and capital requirements. Late in 1992, the Instruments Division will complete construction of a 184,000 square foot manufacturing facility in Kalamazoo, Michigan, which will be internally funded. Though not anticipated at this time, should additional funds be required, the Company has unsecured lines of credit with banks totaling $39.0 million. At December 31, 1991, only $6.7 million of these lines has been utilized to fund operating activities overseas.

CONSOLIDATED BALANCE SHEET
STRYKER CORPORATION AND SUBSIDIARIES

December 31 (in thousands, except per share amounts)	1991	1990
Assets		
CURRENT ASSETS		
Cash and cash equivalents	$52,921	$38,672
Marketable securities	27,108	15,380
Accounts receivable, less allowance of $2,500 ($1,300 in 1990)	53,268	50,723
Inventories – Note B	78,194	60,133
Prepaid expenses and other current assets	17,187	10,726
Total Current Assets	228,678	175,634
PROPERTY, PLANT AND EQUIPMENT – NOTE E		
Land, buildings and improvements	16,286	13,752
Machinery and equipment	57,454	45,807
	73,740	59,559
Less allowance for depreciation	37,684	30,859
	36,056	28,700
OTHER ASSETS		
Intangibles, less accumulated amortization of $4,528 ($2,622 in 1990) – Note C	4,160	4,266
Miscellaneous	1,422	921
	5,582	5,187
	$270,316	$209,521
Liabilities and Stockholders' Equity		
CURRENT LIABILITIES		
Notes payable – Note E	$6,746	$2,345
Accounts payable	29,148	20,850
Accrued compensation	21,203	16,208
Income taxes	8,856	6,318
Accrued expenses and other liabilities	21,929	11,636
Current maturities of long-term debt	500	400
Total Current Liabilities	88,382	57,757
LONG-TERM DEBT, EXCLUDING CURRENT MATURITIES – NOTE E	1,400	1,900
DEFERRED INCOME TAXES	659	1,989
STOCKHOLDERS' EQUITY – NOTE F		
Common stock, $.10 par value:		
Authorized – 50,000 shares		
Outstanding – 47,597 shares (47,464 in 1990)	4,760	4,746
Additional paid-in capital	6,013	4,757
Retained earnings	166,748	136,053
Foreign translation adjustments	2,354	2,319
Total Stockholders' Equity	179,875	147,875
	$270,316	$209,521

See notes to consolidated financial statements.

CONSOLIDATED STATEMENT OF EARNINGS
STRYKER CORPORATION AND SUBSIDIARIES

Years Ended December 31 (in thousands, except per share amounts)	1991	1990	1989
Net Sales	$364,825	$280,634	$225,860
Costs and expenses:			
Cost of sales	172,477	132,882	106,899
Research, development and engineering	23,703	19,663	15,572
Selling, general and administrative	117,089	92,384	71,761
	313,269	244,929	194,232
Operating Income	51,556	35,705	31,628
Other income (expense)	1,789	2,395	(598)
Earnings Before Income Taxes and Extraordinary Item	53,345	38,100	31,030
Income taxes – Note H	20,270	14,475	11,800
Earnings Before Extraordinary Item	33,075	23,625	19,230
Extraordinary gain, less income taxes of $6,075 – Note D		9,910	
Net Earnings	$33,075	$33,535	$19,230
Earnings Per Share of Common Stock:			
Before extraordinary item	$.70	$.50	$.41
Extraordinary gain		.21	
Net Earnings	$.70	$.71	$.41
Average Number of Shares Outstanding	47,526	47,396	47,178

See notes to consolidated financial statements.

CONSOLIDATED STATEMENT OF STOCKHOLDERS' EQUITY
STRYKER CORPORATION AND SUBSIDIARIES

Years Ended December 31 (in thousands)	Common Stock	Additional Paid-In Capital	Retained Earnings	Foreign Translation Adjustments
Balance at December 31, 1988, as previously reported	$2,346	$4,764	$83,288	$621
Adjustment for May 13, 1991 stock split – Note F	2,346	(2,346)		
Balance at January 1, 1989, as restated	4,692	2,418	83,288	621
Net earnings for 1989			19,230	
Sales of 384 shares of common stock under option, including $407 income tax benefit	40	1,471		
Translation adjustment				269
Balance at December 31, 1989	4,732	3,889	102,518	890
Net earnings for 1990			33,535	
Sales of 152 shares of common stock under option, including $283 income tax benefit	14	868		
Translation adjustment				1,429
Balance at December 31, 1990	4,746	4,757	136,053	2,319
Net earnings for 1991			33,075	
Sales of 134 shares of common stock under option, including $799 income tax benefit	14	1,256		
Cash dividend declared – Note F			(2,380)	
Translation adjustment				35
Balance at December 31, 1991	$4,760	$6,013	$166,748	$2,354

See notes to consolidated financial statements.

CONSOLIDATED STATEMENT OF CASH FLOWS
STRYKER CORPORATION AND SUBSIDIARIES

Years Ended December 31 (in thousands)	1991	1990	1989
OPERATING ACTIVITIES			
Earnings before extraordinary item	$33,075	$23,625	$19,230
Extraordinary gain		9,910	
Net Earnings	33,075	33,535	19,230
Adjustments to reconcile net earnings to net cash provided by operating activities:			
Depreciation	9,890	6,468	4,990
Amortization	1,906	641	1,322
Provision for losses on accounts receivable	1,200	300	25
Deferred income taxes (credit)	(5,872)	(1,752)	928
Changes in operating assets and liabilities:			
Increase in accounts receivable	(3,682)	(2,928)	(8,390)
Increase in inventories	(18,103)	(7,530)	(1,628)
Increase in accounts payable	8,340	9,126	2,562
Increase in income taxes	2,766	3,147	350
Other	8,124	7,321	2,111
Net Cash Provided by Operating Activities	37,644	48,328	21,500
INVESTING ACTIVITIES			
Purchases of property, plant and equipment	(16,570)	(11,935)	(7,106)
Purchases of marketable securities	(11,728)	(15,380)	
Business acquisition – Note C		(1,200)	
Net Cash Used in Investing Activities	(28,298)	(28,515)	(7,106)
FINANCING ACTIVITIES			
Proceeds from borrowings	4,401	2,345	
Payments on borrowings	(400)	(3,724)	(673)
Proceeds from exercise of stock options	1,270	882	1,511
Other	(198)	(132)	(403)
Net Cash Provided by (Used in) Financing Activities	5,073	(629)	435
Effect of exchange rate changes on cash and cash equivalents	(170)	206	(149)
Increase in Cash and Cash Equivalents	14,249	19,390	14,680
Cash and cash equivalents at beginning of year	38,672	19,282	4,602
Cash and Cash Equivalents at End of Year	$52,921	$38,672	$19,282

See notes to consolidated financial statements.

Note A – *Significant Accounting Policies*

BUSINESS: Stryker Corporation develops, manufactures and markets specialty surgical and medical products which are sold primarily to hospitals throughout the world.

PRINCIPLES OF CONSOLIDATION: The consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries after elimination of all significant intercompany accounts and transactions.

REVENUE RECOGNITION: Revenue is recognized on the sale of products when the related goods have been shipped or services have been rendered.

CASH EQUIVALENTS AND MARKETABLE SECURITIES: Cash equivalents are highly liquid investments with a maturity of three months or less when purchased. Marketable securities are valued at cost which approximates market value.

INVENTORIES: Inventories are stated at the lower of cost or market. Cost for approximately 61% (65% in 1990) of inventories is determined using the lower of first-in, first-out (FIFO) cost or market. Cost for certain domestic inventories is determined using the last-in, first-out (LIFO) cost method. The FIFO cost for all inventories approximates replacement cost.

PROPERTY, PLANT AND EQUIPMENT: Property, plant and equipment is stated at cost. Depreciation is computed by the straight-line method over the estimated useful lives of the assets.

INTANGIBLE ASSETS: Intangible assets represent the excess of purchase price over fair value of tangible net assets of acquired businesses. Intangible assets, which include patents, exclusive distribution rights and intangibles not specifically identifiable, are being amortized using the straight-line method over periods of two to sixteen years.

RETIREMENT PLANS: Substantially all Company employees are covered by profit sharing or defined contribution retirement plans.

INCOME TAXES: Provision is made for deferred income taxes which result from timing differences between financial reporting and tax recognition of certain income and expense items.

EARNINGS PER SHARE: Earnings per share is based upon the average number of shares of common stock outstanding during each year. Shares subject to option are not included in earnings per share computations because the present effect thereof is not materially dilutive.

RECLASSIFICATIONS: Certain amounts for 1990 have been reclassified to conform with the 1991 presentation.

Note B – *Inventories*

Inventories are as follows (in thousands):

	December 31	
	1991	1990
Finished goods	$43,015	$35,482
Work-in-process	18,659	14,900
Raw material	24,057	16,695
FIFO cost	85,731	67,077
Less LIFO reserve	7,537	6,944
	$78,194	$60,133

Note C – *Business Acquisition*

In June 1990, the Company purchased the Driskell Bioengineering dental implant product line from Quintron, Inc. The Company had previously marketed this product line since 1988.The patents and other intangible assets acquired are being amortized over periods of five to ten years. Pro forma consolidated results including the purchased business would not differ significantly from reported results.

Note D – *Extraordinary Gain*

In July 1990, the Company settled its long-standing patent litigation with Zimmer, Inc., relating to artificial implant devices sold by the Company's subsidiary, Osteonics Corp., under the name "UHR Universal Head" and formerly sold by Zimmer, Inc., under the name "Bi-Articular Hip." Under the terms of the settlement, Zimmer made a cash payment to the Company and agreed to continue to refrain from selling its Bi-Articular Hip. Osteonics remains free to continue marketing its UHR hip implants. The litigation settlement resulted in a net gain of $9,910,000, which is included in the Company's 1990 operating results as an extraordinary gain.

Note E – *Borrowings*

The Company and its subsidiaries have unsecured short-term line of credit arrangements with banks aggregating $20,000,000 domestically and $19,000,000 equivalent in foreign currencies. Borrowings under these lines at December 31, 1991 were $6,746,000 in foreign funds at an average interest rate of 8.1%. These lines generally expire May 31, 1992.

Long-term debt is as follows (in thousands):

	December 31	
	1991	1990
Revenue bonds	$1,900	$2,300
Less current maturities	500	400
	$1,400	$1,900

The revenue bonds are secured by plant and equipment with a net carrying amount of $6,000,000 at December 31, 1991. Interest is payable at a rate equal to 65% of the base lending rate. Maturities of debt after 1992 are: 1993 – $600,000 and 1994 – $800,000.

Total interest expense, which is included in other income (expense) and approximates interest paid, was $655,000 in 1991, $511,000 in 1990 and $688,000 in 1989.

Note F – *Capital Stock*

The Company has key employee and director Stock Option Plans under which options are granted at a price not less than fair market value at date of grant. The options are granted for periods of up to ten years and become exercisable in varying installments. A summary of stock option activity follows:

	Shares	Option Price Per Share
Options outstanding at January 1, 1990	1,516,300	$2.45 — $9.50
Granted	562,000	11.25 — 14.63
Canceled	(41,400)	4.34 — 6.75
Exercised	(153,600)	2.45 — 9.50
Options outstanding at December 31, 1990	1,883,300	3.20 — 14.63
Granted	25,500	30.75
Canceled	(52,600)	4.34 — 14.63
Exercised	(146,450)	4.34 — 14.63
Options outstanding at December 31, 1991	1,709,750	$3.20 — $30.75

At December 31, 1991, options for 884,450 shares were exercisable and 1,906,700 shares were reserved for future grants.

On May 13, 1991, the Company effected a two-for-one stock split. All share and per share data and affected amounts have been adjusted to reflect the stock split as though it had occurred at the beginning of the periods presented.

On December 11, 1991, the Board of Directors declared a cash dividend of five cents per share to shareholders of record on December 31, 1991, payable on January 31, 1992.

The Company has 500,000 authorized shares of $1 par value preferred stock, none of which are outstanding.

Note G – *Retirement Plans*

Retirement plan expense under the Company's profit sharing and defined contribution retirement plans totaled $3,631,000 in 1991, $2,764,000 in 1990 and $2,139,000 in 1989.

Note H – *Income Taxes*

Earnings before income taxes and extraordinary item consist of the following (in thousands):

	1991	1990	1989
United States Operations	$45,480	$32,878	$28,150
Foreign Operations	7,865	5,222	2,880
	$53,345	$38,100	$31,030

The components of the provision for income taxes follow (in thousands):

	1991	1990	1989
Currently payable:			
Federal	$17,985	$10,751	$7,876
State, including Puerto Rico	4,467	2,653	1,851
Foreign	3,690	2,823	1,145
	26,142	16,227	10,872
Deferred tax expense (credit)	(5,872)	(1,752)	928
	$20,270	$14,475	$11,800

A reconciliation of the statutory federal income tax rate to the effective tax rate follows:

	1991	1990	1989
U.S. statutory income tax rate	34.0%	34.0%	34.0%
Add (deduct):			
State taxes, less effect of federal deduction	4.3	4.2	3.7
Foreign income taxes at rates different from the U.S. statutory rate	1.3	1.3	2.1
Tax benefit relating to operations in Puerto Rico	(2.4)	(1.0)	(.7)
Research and development tax credit	(1.7)	(1.1)	(1.1)
Earnings of Foreign Sales Corporation	(1.3)	(.8)	(.9)
Other	3.8	1.4	.9
	38.0%	38.0%	38.0%

No provision has been made for U.S. income taxes that may result from future remittances of the undistributed earnings ($11,464,000 at December 31, 1991) of foreign subsidiaries. It is expected that in the event of a distribution, the additional U.S. income taxes thereon would be eliminated by foreign tax credits.

In December 1987, the Financial Accounting Standards Board issued Statement No. 96, "Accounting for Income Taxes." The Board has subsequently issued Statement No. 108 to postpone the effective date of Statement No. 96. Accordingly, the Company is required to adopt the new method of accounting for income taxes no later than 1993. The adoption of Statement No. 96 is not expected to have a material impact on the Company's financial position.

Total income taxes paid were $22,550,000 in 1991, $18,909,000 in 1990 and $10,171,000 in 1989.

Note I – *Geographic Data*

Geographic area information follows (in thousands):

	1991	1990	1989
NET SALES			
United States operations:			
Domestic	$253,479	$198,321	$164,292
Export	72,256	50,895	40,920
Foreign operations:			
Europe	47,685	39,315	26,986
Other	24,401	13,200	9,114
Eliminations	(32,996)	(21,097)	(15,452)
Net Sales	$364,825	$280,634	$225,860
OPERATING INCOME (LOSS)			
United States operations	$49,492	$36,304	$33,122
Foreign operations:			
Europe	7,497	5,462	2,370
Other	717	(216)	1,317
Total Foreign	8,214	5,246	3,687
Corporate expenses	(6,150)	(5,845)	(5,181)
Total Operating Income	$51,556	$35,705	$31,628
ASSETS			
United States operations	$156,155	$126,227	$108,688
Foreign operations:			
Europe	24,607	20,481	15,387
Other	15,834	7,772	7,625
Corporate	73,720	55,041	20,633
Total Assets	$270,316	$209,521	$152,333

Sales between geographic areas, included in export sales, are made at cost plus a factor to cover indirect costs.

Gains (losses) on foreign currency transactions, which are included in other income (expense), totaled $(898,000), $564,000 and $(114,000) in 1991, 1990 and 1989, respectively.

Corporate assets consist primarily of domestic cash and cash equivalents and marketable securities.

Note J – *Leases*

The Company leases various manufacturing and office facilities and equipment under operating leases. Future minimum lease commitments under these leases are as follows (in thousands):

1992	$5,568
1993	3,423
1994	2,849
1995	1,306
1996	929
Thereafter	106
	$14,181

Rent expense totaled $6,686,000 in 1991, $4,959,000 in 1990 and $3,891,000 in 1989.

Note K – *Contingencies*

The Company is involved in various claims and legal actions arising in the normal course of business. The Company does not anticipate material losses as a result of these actions.

Report of Independent Auditors

Board of Directors
Stryker Corporation

We have audited the accompanying consolidated balance sheet of Stryker Corporation and subsidiaries as of December 31, 1991 and 1990, and the related consolidated statements of earnings, stockholders' equity and cash flows for each of the three years in the period ended December 31, 1991. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Stryker Corporation and subsidiaries at December 31, 1991 and 1990, and the consolidated results of their operations and their cash flows for each of the three years in the period ended December 31, 1991, in conformity with generally accepted accounting principles.

Ernst & Young

Kalamazoo, Michigan
January 31, 1992

SALES ANALYSIS, QUARTERLY DATA

(dollars in thousands, except per share data)

Product Line Sales (Unaudited)	1991		1990		1989	
SURGICAL						
Orthopaedic Implants, Endoscopic Systems, Powered Surgical Instruments and Other Operating Room Devices	$302,938	83%	$230,941	82%	$184,053	81%
MEDICAL						
Patient Handling Equipment and Physical Therapy Services	61,887	17	49,693	18	41,807	19
	$364,825	100%	$280,634	100%	$225,860	100%

Domestic/International Sales (Unaudited)	1991		1990		1989	
Domestic	$253,479	69%	$198,321	71%	$164,292	73%
International	111,346	31	82,313	29	61,568	27
	$364,825	100%	$280,634	100%	$225,860	100%

Summary of Quarterly Data (Unaudited)

	1991 Quarter Ended				1990 Quarter Ended			
	March 31	June 30	Sept. 30	Dec. 31	March 31	June 30	Sept. 30	Dec. 31
Net Sales	$85,681	$88,591	$89,912	$100,641	$67,582	$67,751	$67,636	$77,665
Gross Profit	46,420	46,121	46,674	53,133	36,556	35,637	35,364	40,195
Earnings Before Income Taxes and Extraordinary Item	12,550	11,935	12,100	16,760	10,180	8,910	9,115	9,895
Earnings Before Extraordinary Item	7,780	7,400	7,500	10,395	6,310	5,525	5,650	6,140
Extraordinary Gain							9,910	
Net Earnings	7,780	7,400	7,500	10,395	6,310	5,525	15,560	6,140
Earnings Per Share of Common Stock:								
Before Extraordinary Item	.16	.16	.16	.22	.13	.12	.12	.13
Extraordinary Gain							.21	
Net Earnings	.16	.16	.16	.22	.13	.12	.33	.13
Market Price of Common Stock:								
High	20-5/8	27-3/4	31	52-1/4	13-3/8	14-1/4	15-3/8	16-7/8
Low	13-3/4	19-7/8	24-1/2	25-1/2	9-5/8	11-3/8	11-1/8	10-7/8

The price quotations reported above were supplied by the National Association of Securities Dealers and have been adjusted for the two-for-one stock split effective May 13, 1991. In 1991 the Company declared a cash dividend of five cents per share to shareholders of record on December 31, 1991, payable on January 31, 1992. No cash dividends were paid or declared during 1990.

BOARD OF DIRECTORS AND OFFICERS

Board of Directors

John W. Brown
Chairman, President and Chief Executive Officer, Stryker Corporation.

Howard E. Cox, Jr.
General Partner, Greylock Partners & Co.

*Donald M. Engelman, Ph.D.
Professor and Chairman of Molecular Biophysics and Biochemistry, and Professor of Biology, Yale University.

Jerome H. Grossman, M.D.
Chairman and Chief Executive Officer, New England Medical Center, Inc.

*John S. Lillard
Chairman, JMB Institutional Realty Corp.

Ronda E. Stryker
Granddaughter of the founder of the Company and daughter of the former President of the Company. A director of Comerica Bank, the L. Lee Stryker Center and Trustee of Kalamazoo College.

*Gerard Thomas
Attorney, Miller, Canfield, Paddock & Stone.

**Audit Committee*

Corporate Officers

John W. Brown
Chairman, President and Chief Executive Officer

Ronald A. Elenbaas
Vice President, President, Surgical Group

William T. Laube, III
Vice President, President, Stryker Pacific

Robert D. Monk
Treasurer/Controller and Assistant Secretary

Julia M. Paradine-Rice
Assistant Treasurer

David J. Simpson
Vice President, Chief Financial Officer and Secretary

Thomas R. Winkel
Vice President, President, Stryker Americas/Middle East

Operating Divisions

OSTEONICS CORP.
- Edward B. Lipes – President
- Gary L. Grenter – Vice President, Operations
- Brian K. Hutchison – Vice President, Finance
- Jon E. Kramer – Vice President, Sales and Marketing
- Michael T. Manley, Ph.D. – Vice President, Science and Technology

PHYSIOTHERAPY ASSOCIATES, INC.
- Jason T. Blackwood – President
- Robert Ben Allen, Jr. – Vice President

STRYKER AMERICAS/MIDDLE EAST
- Thomas R. Winkel – President

STRYKER BIOTECH
- Samuel Yin, Ph.D. – Director

STRYKER DENTAL IMPLANTS
- Ronald A. Elenbaas – President
- Stephen Si Johnson – Executive Vice President
- James Heath – General Manager

STRYKER ENDOSCOPY
- Ronald A. Elenbaas – President
- Pedro Martinez – Vice President, General Manager
- William E. Chang – Vice President, Research and Development

STRYKER EUROPE
- Jean-Pierre Boucher – President
- Alain Guez – Vice President, France

STRYKER INSTRUMENTS
- Ronald A. Elenbaas – President
- Stephen Si Johnson – Executive Vice President, General Manager
- Bradley D. Black – Vice President, Human Resources

STRYKER MEDICAL
- Harry E. Carmitchel – President
- Kenneth A. Palmer – Executive Vice President, Operations
- Paul D. Chapman – Vice President of Marketing and New Business Development
- Mark J. Fletcher – Vice President, Sales

STRYKER PACIFIC
- William T. Laube, III – President
- Patrick C. W. Ng – Vice President, Operations
- John D. Pierson – President, Japan
- Yoshiaki Nakazawa – Executive Vice President, Japan
- Hyung-Cheol Park – Vice President, Korea
- Aidan Whitham – Vice President, Australia

General Counsel
Breed, Abbott & Morgan, New York, New York

Auditors
Ernst & Young, Kalamazoo, Michigan

Transfer Agent and Registrar
The First National Bank of Chicago,
Chicago, Illinois
(800/446-2617)

Investor Contact
David J. Simpson, Vice President, Chief Financial Officer and Secretary

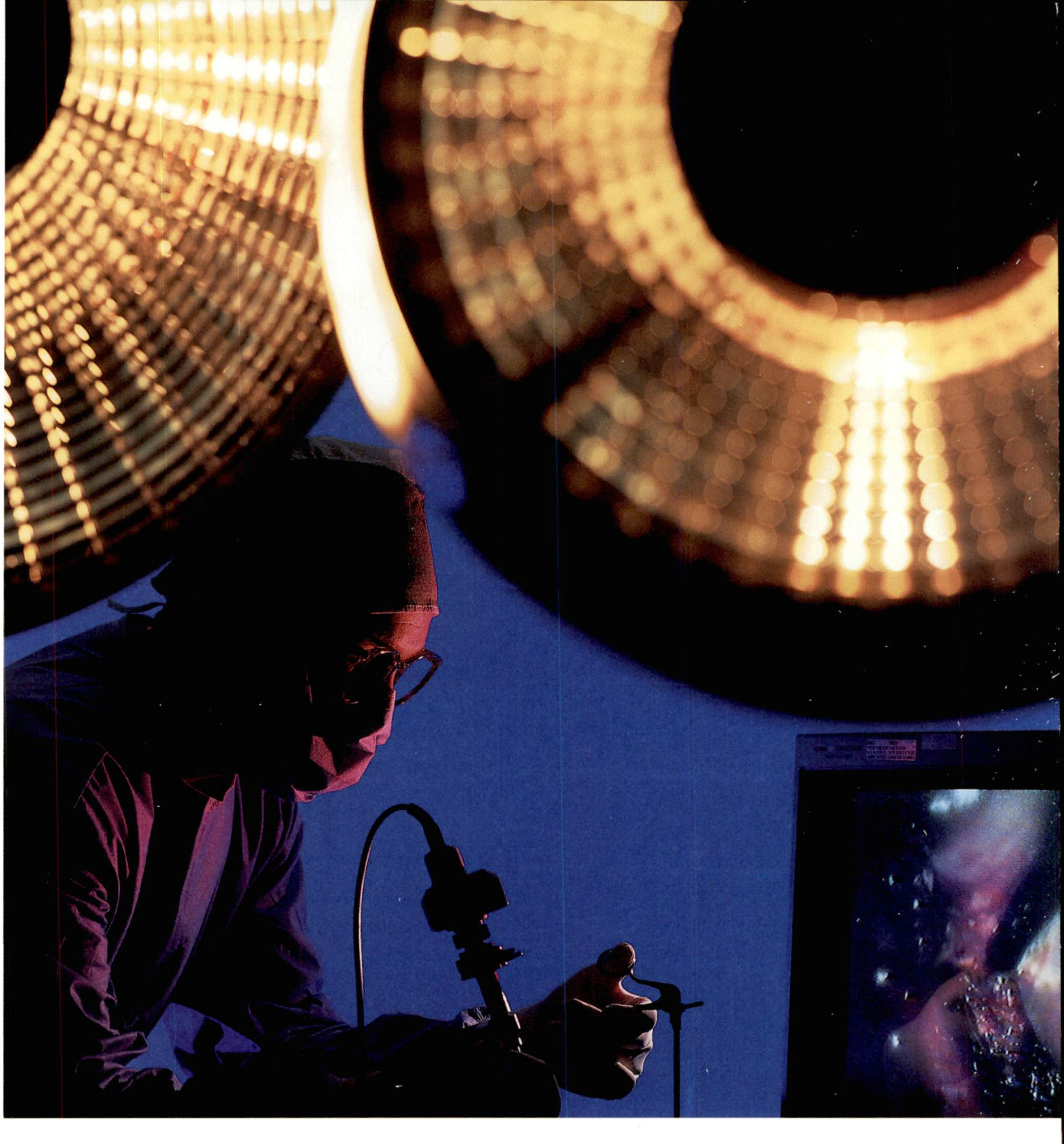
Annual Meeting
The Annual Meeting of Stockholders of Stryker Corporation will be held at the Radisson Plaza Hotel at The Kalamazoo Center, Kalamazoo, Michigan, on Tuesday, April 21, 1992, at 2:00 p.m.

Form 10-K
The Company files Form 10-K with the Securities and Exchange Commission. Shareholders wishing a copy of the 1991 report may request it by writing to:

Secretary
Stryker Corporation
P.O. Box 4085
Kalamazoo, Michigan
49003-4085

Trademarks
Stryker Corporation or its subsidiaries own the registered trademarks: Stryker, Osteonics, Omnifit and Omniflex, and the trademarks: ConstaVac, Omniflex-HA and LFIT, used in this report.

Stock Listing
The Company's common stock is traded in the over-the-counter market on the NASDAQ National Market System under the symbol STRY.



STRYKER ENDOSCOPY, OSTEONICS, Stryker Instruments and Stryker Medical all operate in distinct niche markets and employ distinctive sets of technological skills. But in spite of these differences, all share a single set of core principles: a sharp focus on market needs (including the need to contain health care costs), a commitment to quality in products and customer service, and a dedication to technological innovation. Stryker's skill and tenacity in pursuing these principles have made the Stryker name a byword for excellence among medical professionals around the world.

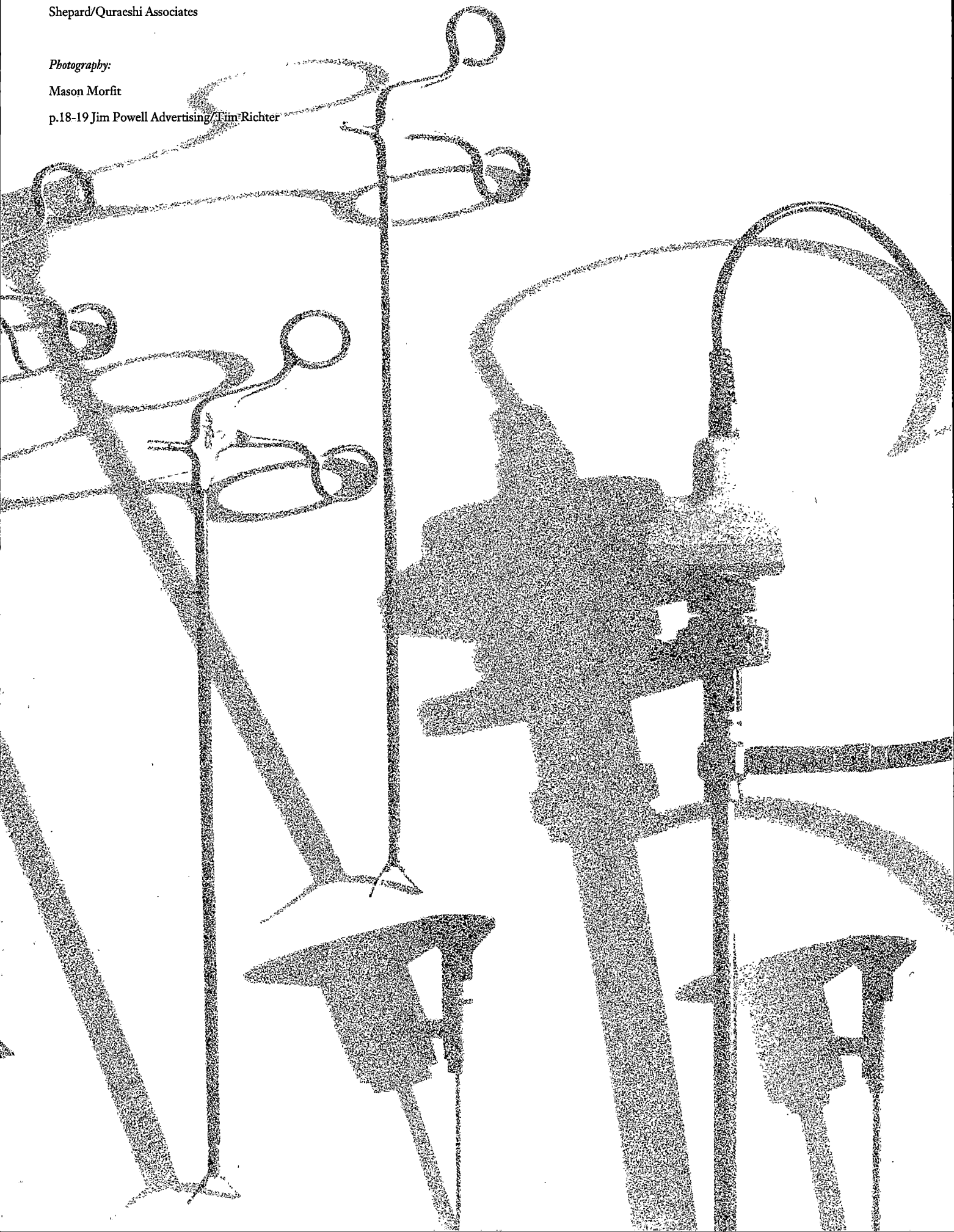
Design:

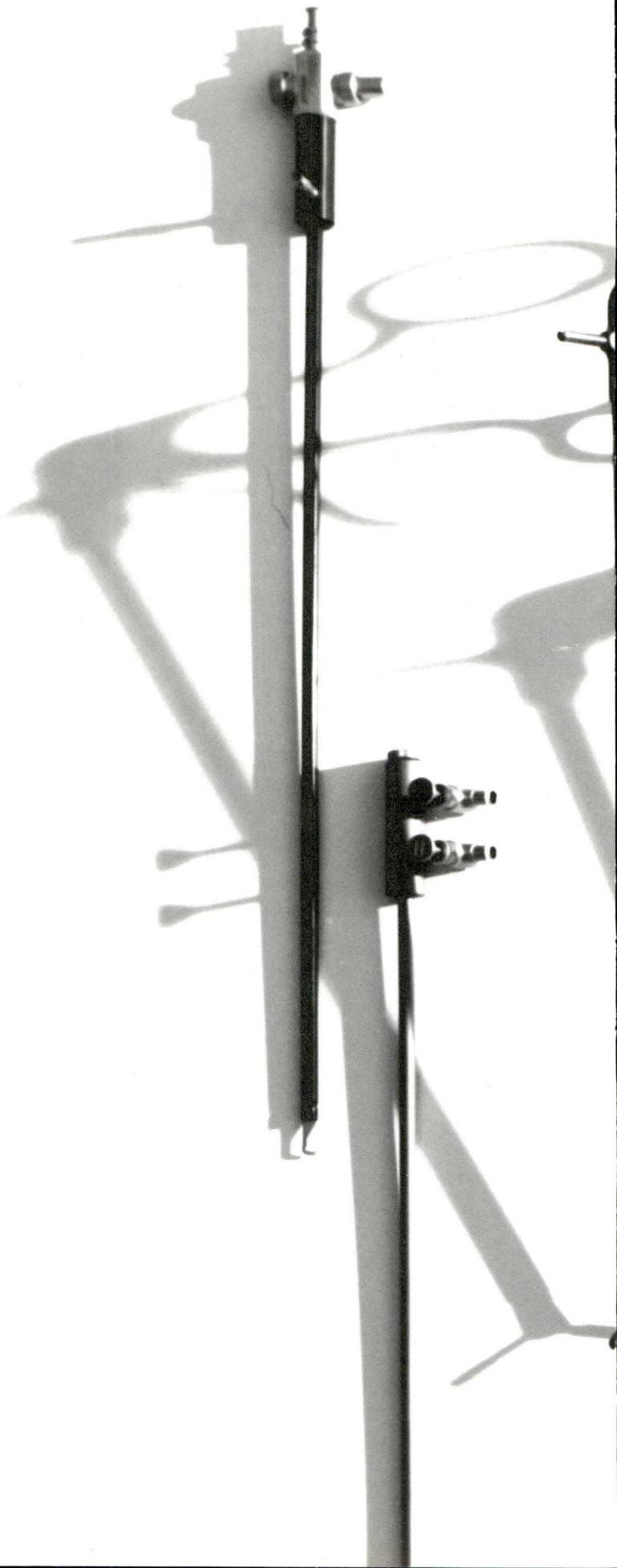
Shepard/Quraeshi Associates

Photography:

Mason Morfit

p.18-19 Jim Powell Advertising/Tim Richter





Stryker Corporation
2725 Fairfield Road
Kalamazoo, Michigan 49002

P.O. Box 4085
Kalamazoo, Michigan
49003-4085

Telephone (616) 385-2600

Stryker®
Medical

Advanced Transport Stretcher
MODEL 721

Renaissance
SERIES

True Technological Advances For Patient Transport

The Stryker Renaissance Series Advanced Transport Stretcher is remarkably equipped with the innovations required to match the dynamics of transport and transfer.

This is the future of unequaled selection, intelligence and quality.

This is the Renaissance.

- Integrated Patient Transfer System
- Dual End or Dual Side-mounted Hydraulic Foot Controls
- 24.5" - 38" Height Range
- Omni Surface™ Casters
- Twin Pedestal Hydraulics
  - Optimum Stability
  - Hands-free Operation
- 3" or 4" Pad with Lenticular Fabric
- Fold Down Siderails
- Four Wheel Brakes
- Locking Caster Steering
- Integrated Storage Tray with O_2 Holder
- Rubber Bumper System

N ENLIGHTENED VISION OF PATIENT TRANSPORT

Explore a new age in Patient Care, with the Renaissance Series of beds and stretchers from Stryker.

This is your Renaissance. This is your vision.

The Renaissance Series is an **evolution** of your ideas and a **revolution** of Stryker technology.

Fresh approaches to old issues. Responsible answers to new issues. Ideas sparked from collective imaginations. Features crafted with renewed dedication.

The Renaissance Series from Stryker.

SPECIFICATIONS
Model 721

Bed Width		
Overall		30"
Patient Surface (Mattress)		24"
Bed Length		
Overall		81"
Patient Surface (Mattress)		75.5"
Bed Weight		
Standard Configuration		250 lbs. (approx)
Bed Height (to litter top)		
High		38"
Low		24.5"
Caster Diameter		8"
Siderails		
Fold	Height	15"
	Length	55"
Articulation		
Fowler		0° - 90°
Trend/Rev. Trend		+15°/-18°
Integrated Transfer System		
Width		10"
Length		64"

Stryker reserves the right to change specifications without notice.

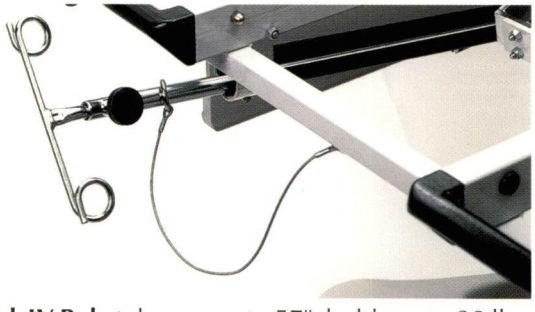
EFFICIENT ACCESSORIES

Upright Swing Away Oxygen Bottle Holder holds D & E size tanks. Fits in IV receptacles. Design allows tank to pivot on stretcher corners, for maneuvering through tight doorways and cramped elevators.

Unique molded **Wheel Covers** protect caster mechanisms from debris and ease housekeeping chores. Available only with 5th Wheel Steering option.

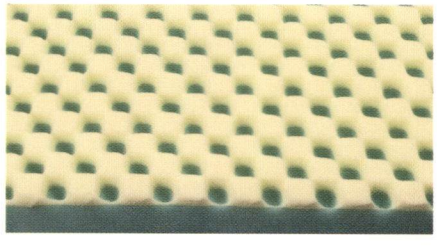
Multi-use **Defibrillator Tray/Padded Foot Extender/Footboard** provides versatility and staff convenience.

The molded **Monitor Tray** is sturdy and dependable, and will hold up to 40 lbs.



A **Tethered IV Pole** telescopes to 57", holds up to 30 lbs and stores in its own tube alongside the stretcher. A Removable IV Pole is also available.

Headboard/Footboard provides patient protection, removes easily for patient access. Chartholder saves steps/time.



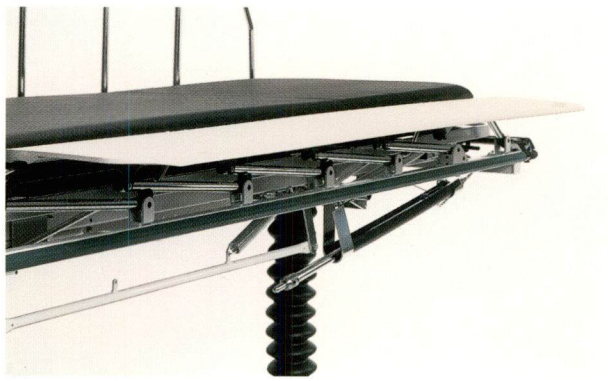
The optional Dual Density **Foam Mattress** enhances patient comfort.

Siderail Pads offer valuable protective covering with full enclosure, yet immediate access when necessary. Padding simply swings away, but also remains hooked on with strong Velcro straps.

Patient Enclosure

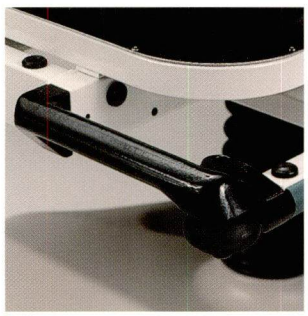
Siderails

15" high x 55" long fabricated steel **Fold Down Siderails** provide excellent patient enclosure, but collapse neatly down toward foot end to allow full access. Five weld points per siderail help to ensure stability and durability. The siderail latch mechanism is located toward head end.



Dual-mounted Integrated Transfer System Board contributes to easier patient transfer.

Bumpers



Durable, hard rubber side strip bumpers and a unique roller at each corner protect stretcher, doors and walls.

Storage

An integrated **Storage Tray** with substantial capacity holds patient belongings and medical equipment. Universal size O_2 holder is standard with all units.

Litter Positioning

Pneumatic Fowler

The optional **Pneumatic Fowler** is built with two handles and two cylinders for quick, easy and infinitely variable positioning. No cables to stretch or break. Adjustment from 0° - 90°.

Manual Fowler

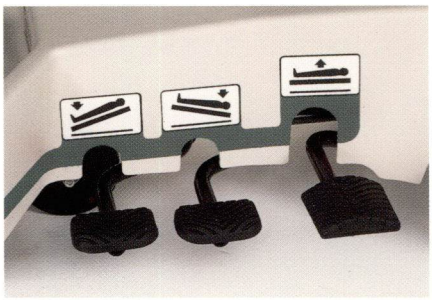
The standard **Manual Fowler** is built strong enough to endure even the toughest trauma situations. 0° - 90° adjustment.

REMARKABLE CONVENIENCES

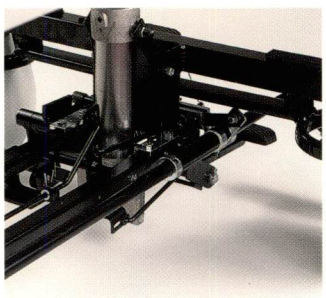
Control Preference/Stryker Hydraulics

Dual End

Dual Side

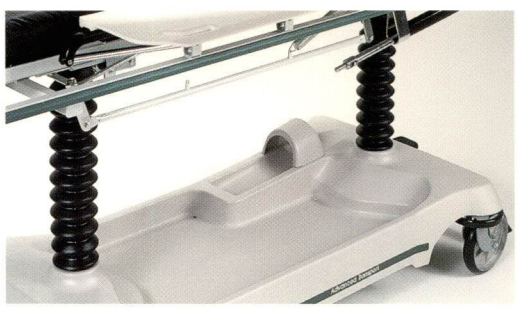


Foot-activated hydraulics raise bed with each pump, lower either end or the entire litter with two pedals. Total "hands-free" operation helps to maintain sterile technique at all times.

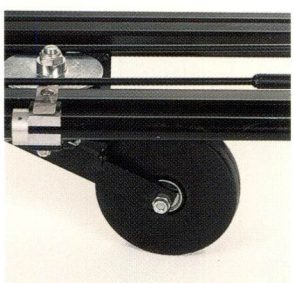


Direct linkage, low maintenance hydraulic system. Simplicity *is* durability. Three Flo-Check valves are easily accessible for adjustment and maintenance.

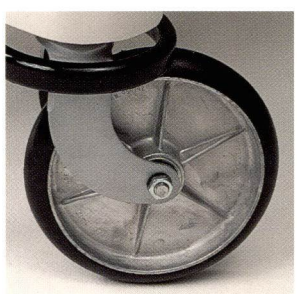
Stryker's Twin Pedestal design affords superior stability; especially suited for CPR and Trauma situations.



Maneuverability/Braking



Fifth Wheel



Omni Surface™ Casters

Steering Grips

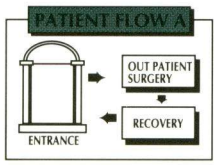
The **Locking Caster Steering** is a valuable standard feature to help maneuver the stretcher. For enhanced performance, the Stryker exclusive **5th Wheel Steering** option, activated at both ends of the stretcher, provides true tracking and superior cornering allowing transporters to corner in over 30% less space. **8" Omni Surface™ Casters** offer minimum friction on a variety of surfaces including carpet, tile or concrete. **Steering Grips** located at both the head and foot ends help improve body mechanics and provide sure control of the stretcher.

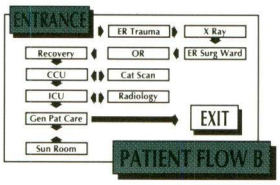
Stryker's **Four Wheel Brake System** is the standard of the industry. One lever, accessible at both head and foot end, engages and disengages all four wheels. The coated, solid steel rings firmly secure the wheels.

THE BASICS OF PATIENT TRANSPORT

A BRIEF HISTORY LESSON

This is the way we were taught.
The way our teachers were taught.
Patient Transport and Transfer is basic.
It is muscle, motion and manpower.





A PRIMER IN CURRENT AFFAIRS

Who's Doing the Work? Staff members trained for and dedicated exclusively to patient movement are considered a luxury in most hospitals. Highly trained clinical personnel are assuming these non-clinical duties on an increasingly frequent basis.

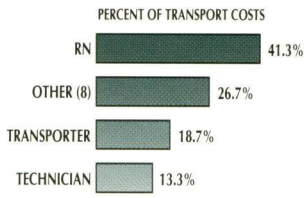
What's Involved? Transport no longer occurs simply between points A and B. Increasing levels of acuity cause patient shuttles of 20 - 30 times per stay. Specialty areas help assure sophisticated patient treatment, but they also a) require transport to a variety of locations, b) dictate transfer onto a variety of patient surfaces, and c) mandate the use of equipment that adjusts to various surface heights.

Why Be Concerned?

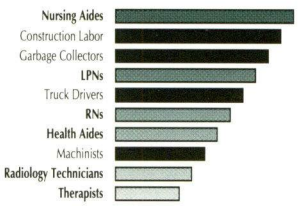
- ***The Difficulty Factor*** - Patient movement is not only increasing in frequency, but in difficulty as well. The number of Patient Transports and Transfers is growing at alarming rates, in conjunction with a meteoric rise of associated costs. Expense of personnel, time and current equipment available to the industry all contribute to these significant costs.
- ***The Injury Factor*** - Patient handling related injuries to valuable clinical personnel represent significant direct and indirect costs to the hospital. Although the rate of occurrence represents only 12% of the total number of staff injuries, the cost of those incidents represents 45% of a typical hospital's total associated costs of treating staff injuries. Moreover, other hidden costs such as agency nurses, legal fees, workmen's compensation, etc. are often overlooked as being related to staff injury.

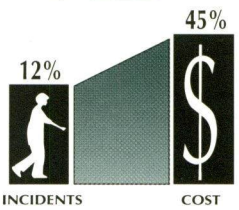
What's The Plan? The solution is as old as the wheel, lever or pulley. Let equipment help reduce the work load. As labor costs escalate, advanced equipment can help minimize the risks to valuable personnel while helping to increase their efficiency.

HOSPITAL STUDY [1]



INJURY RATE RANKING [2]

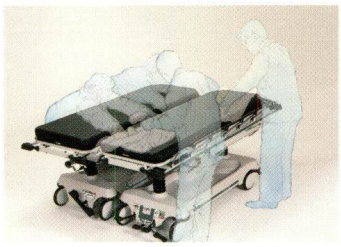




The Benefits of an Integrated Patient Transfer System

A unique innovation proven to reduce the amount of effort required to initiate patient transfer.[3] Every Stryker Renaissance Series Stretcher is equipped with dual-mounted, self-storing Transfer Boards and a mattress with Lenticular, low friction fabric.

BASIC TRANSFER
is muscle and manpower.



STRYKER ADVANCED TRANSFER saves time, manpower and money.

Stryker's new Lenticular Mattress fabric is specifically designed for patient transfer. A ribbed pattern in the surface helps reduce friction by approximately 30% versus other commercially available mattress materials.[4]

The Transfer Board not only bridges the inevitable patient transfer gap, but actually contributes to easier transfer. Its low friction surface and ample size (64" x 10") reduce the effort of lifting, pushing and pulling the patient. So simple to use! It is the logical answer to other devices that are expensive, cumbersome and/or not readily available when needed.

Easily accessible and intuitively obvious to operate; a gentle lift positions the board on the alternate patient surface.

[1] Medikin/HCI Independent Study, April , 1988 [2] "Disabling Back Injuries Among Nursing Personnel," Jenson, Research and Nursing Health, 1987 [3] Physiotherapy Assoc. Study, Nov. 1990
[4] Data available upon request

MODEL 721
Advanced Transport Stretcher

Dual End Controls for Brake/Steer

stryker®
Medical

Open your financial options in capital investments. We'll customize a plan to fit your needs.

Consider an "HMO" plan for your equipment. A tailored Service Contract can protect and add life to your valuable investment.

6300 Sprinkle Rd.
Kalamazoo, MI 49001
(800) 327-0770 (Toll Free)

4/91

Stryker®
Medical

Dual Control
Critical Care Bed
MODEL 2020

Renaissance
SERIES

True Technological Advances For Critical Care

Discover remarkable innovations for specialty care with the Renaissance Series Dual Control Critical Care Bed. Its features are designed with unprecedented patient comfort, uncompromising safety and exceptional clinical advantages such as maneuverability, simplicity and versatility.

This is the future of unequaled selection, intelligence and quality. This is the Renaissance.

- Integrated Patient Scale with Scale-to-Monitor Interface
- Dual Control Operations
  - Push-Button Electronic
  - Traditional Hydraulic
- 22.5" - 35" Height Range
- Head to Groin Fluoroscopy
- Omni Surface™ Casters
- Twin Pedestal Hydraulics
  - Optimum Stability
  - Hands-free Operation
- Fold Down Siderails
- Four Wheel Brakes
- Locking Caster Steering
- Integrated O_2 Holder
- Patient Positioning Package
- Folding IV Pole, permanently attached
- Fiber Flotation Pressure Reduction Mattress
- Integrated Electrical Outlet
- Defib Tray/Footboard
- Bed Extender

N ENLIGHTENED VISION OF CRITICAL CARE

Explore a new age in Patient Care, with the Renaissance Series of beds and stretchers from Stryker.

This is your Renaissance. This is your vision.

The Renaissance Series is an **evolution** of your ideas and a **revolution** of Stryker technology.

Fresh approaches to old issues. Responsible answers to new issues. Ideas sparked from collective imaginations. Features crafted with renewed dedication.

The Renaissance Series from Stryker.

SPECIFICATIONS
Model 2020

Bed Width		
Overall	38"	
Patient Surface (Mattress)	32"	
Bed Length		
Overall	90"	
Patient Surface (Mattress)	80"	
Bed Weight		
(Equipped with scale, IV Poles, Mattress)	495 lbs. (approx)	
Bed Height (to litter top)		
High	35"	
Low	22.5"	
Caster Diameter	8"	
Siderails	Height	Length
Fold	16.5"	52.5"
Fold/Split	16.5"	47"
Articulation		
Fowler	0° - 90°	
Knee Gatch	0° - 35°	
Trend/Rev. Trend	+12°/-12°	
Radiolucency		
Material	Polycarbonate	
	Width	Length
Window Size	29"	39"
Complies with DHHS 21 CFR Sub Chapter J		
Fluoroscopy		
Underbed Clearance	6.5"	
	Width	Length
Window Size	27"	38"
Base to litter Clearance	25"	
Electrical		
Volts	110/115 VAC	
Ampere Rating	5.0 A	
Power	575 VA	
Current Leakage	Less than 100 microamps	
Hertz (Domestic)	60	
Hospital Grade Plug	YES	
With Integrated Electrical Outlet		
115 VAC 60 Hz 15.0 A Intermittent		
115 VAC 60 Hz 10.0 A Continuous		

STANDARD MODEL INCLUDES:

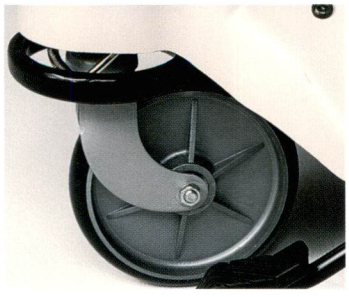
- Foot End Control Board
- Dual-Control Operation (Electric/Hydraulic)
- 22.5" - 35" Height Range
- Head to Groin Fluoro capable litter
- 4" Conductive or Non-Conductive Mattress
- Twin Pedestal Hydraulics
- Fold Down or Split Siderails
- Four Wheel Brakes
- Locking Caster Steering
- Standard Electrical Cord
- Footboard/Headboard
- Function Lock-Out System
- Safety Strips

UPGRADES AND ACCESSORIES

- Head End Control Board
- In-rail Control Pendants
- Non-integrated Removable Control Pendants
- Integrated Patient Scale
- Scale Serial Port for Monitor Interface
- Push Button Patient Positioning Package
  - Emergency Drop
  - Emergency Stop
  - Cardiac Chair
  - LED Readouts for Trend/Fowler Degrees
- 6" Fiber Flotation Mattress
- Integrated Electrical Outlets
- Coil Cord/Storage (not compatible with Integrated Electrical Outlet Option)
- Fowler X-ray Cassette Holder
- IV Pole, Removable
- IV Pole, Permanently attached
- Bed Extender
- Footboard with Defibrillator Tray
- Stationary Defibrillator Tray
- Integrated O_2 Holder
- Body Restraints
- Drainage Bag Holder

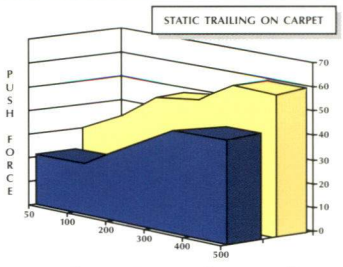
Stryker reserves the right to change specifications without notice.

MASTERFUL MANEUVERABILITY



Omni Surface™ Casters

Exclusive to Stryker, these 8" diameter casters roll easily over uneven surfaces. The special polyurethane, high durometer, material reduces friction, thus allowing the bed to glide over concrete, tile, even carpet.

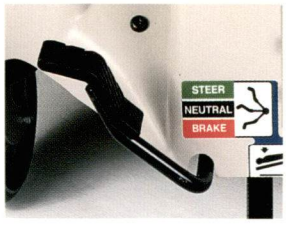


Head & Footboards

Strong and durable, these units are designed with hand cut-outs to help steer. Boards are removable to serve as dependable CPR aids.

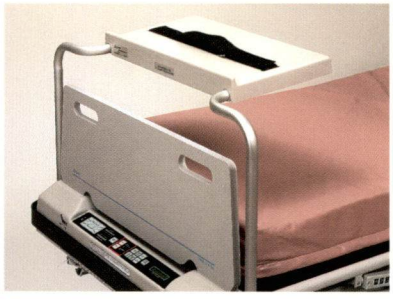
Steering System

Directional Caster Steering allows for truer tracking down long corridors and enhanced maneuverability around corners. It can be activated at both the head or foot ends of the bed.



Monitor Trays

You have a choice of design. Our **stationary tray** fits into foot end receptacles and holds up to 40 lbs., while allowing sufficient clearance for feet. The dual purpose **Footboard/ Defib Tray** has a hinged joint to allow the tray to flip back and store on the footboard. Both units are interchangeable among beds.

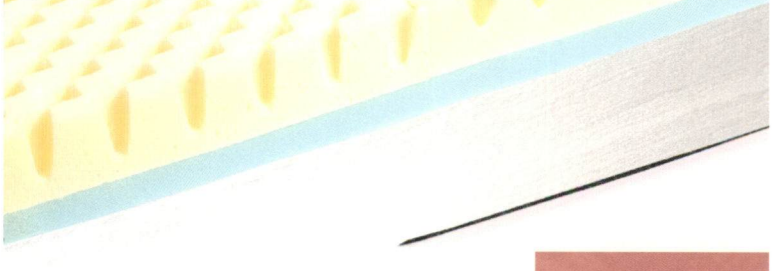


EXCEPTIONAL PATIENT COMFORT

Fiber Flotation Pressure Reduction Mattress

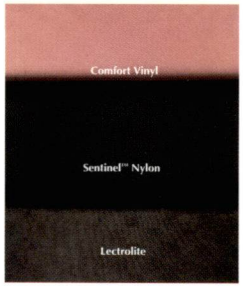
A total protection policy for all your Critical Care Beds. Fiber Flotation with the exclusive Fibercore™ densified polyester provides enhanced patient comfort, reduced interface pressures and longer product life with its modular design. Eliminate costly overlays with one mattress - no air, water, gel, pumps, cubes or adjustment. The Fibercore™ layer optimizes patient weight distribution. Independent tests[1] show readings as low as 14 mm Hg. in critical heel areas.

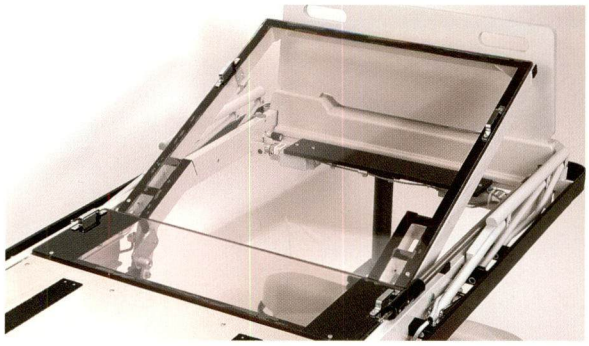
[1] **Twin Cities Testing, Oct. 1991**



Cover Selection

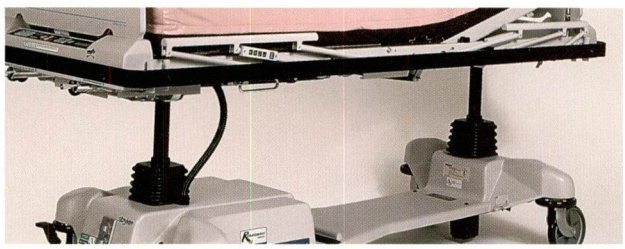
Developed exclusively for health care application, each fabric meets or exceeds stated standards for bacteriastatic, flame retardance, anti-static, non-absorbancy, stain resistance and easy maintenance.

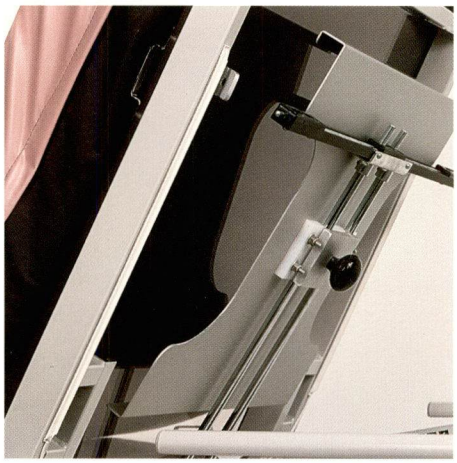




Fluoro Capable Litter

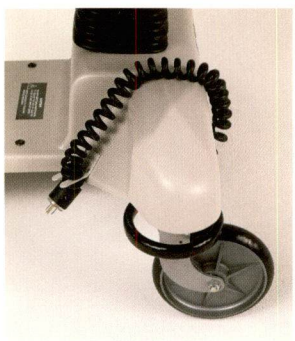
Fluoroscopy and X-ray procedures are a fact of life in any Critical Care unit, but neither have ever been easy on the patient or the caregiver. Now, Stryker helps reduce the amount of movement from surface-to-surface with a radiolucent litter top that allows full coverage from chest to pelvic region. The Stryker Renaissance Series Dual Control Critical Care Bed is designed for compatibility to most C-arms in the marketplace today. Its 27" x 38" window, with 25" clearance under the litter, provides ample room for camera exposure, while C-arm pedestals slide easily under the bed's 6.5" floor clearance.





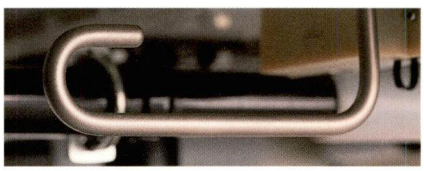
X-Ray Film Cassette Holder

An optional X-ray Cassette holder accepts film cassettes up to 14" x 17" and is accessible from either the side or head of the bed.



Cord Storage

The coiled electrical cord stores easily away in transport.



Drainage Bag Holders

Provide convenient areas to hang Foley Bags on either side of the bed. They are independent of the patient weighing surface and do not interfere with the operation of the bed.

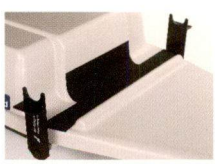
IV Poles

You will be confident with either design. The Permanently Attached, Folding IV Pole is constructed of durable steel, extends to a full 51" from the litter, holds up to 40 lbs., and can be situated on either corner of the head end.

Removable IV Pole fits in any one of four receptacles on the litter, stores conveniently on the bed, telescopes up to 57" and holds up to 30 lbs.

Integrated Electrical Outlet

No need to search for additional wall outlets, when the bed itself is plugged in, additional equipment can be electrically activated with these outlets at the foot end of the bed. Outlet is UL Listed.

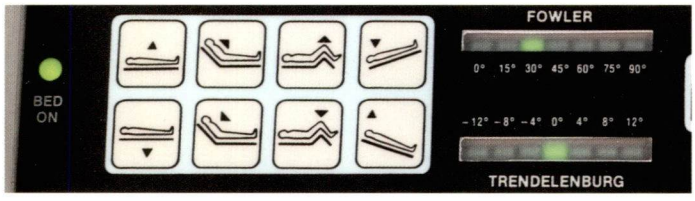


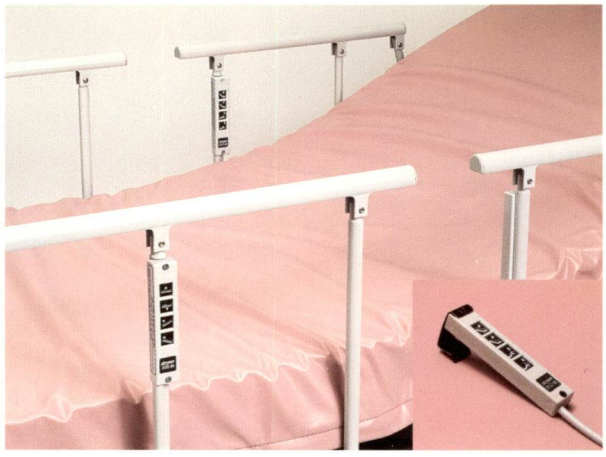
O_2 Bottle Holder

The oxygen tank holder is self-storing and allows easy access from either side of the bed.

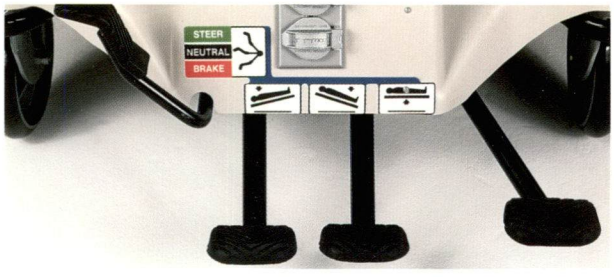
Dual Control Operation

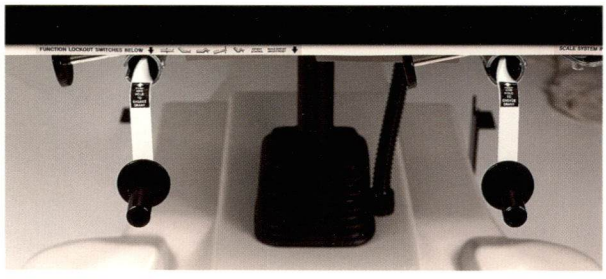
Electric





Stryker's Critical Care Bed offers you an extension of your resourcefulness, with important integrated features you can trust. Our electric operation reduces extra effort. Difficult patient positioning such as Trendelenburg, Cardiac Chair, Fowler, Bed Height, Knee Gatch are all achieved with smooth, gentle motion. Control panels can be available at all four sides of the bed, including four permanently mounted, in-rail control pendants. Clearly marked international graphics on control buttons help for obvious, easy operation. LED indicators inform you of degrees for Fowler and Trendelenburg. Detachable, non-integrated pendants are also available for patients to adjust Fowler and knee areas.

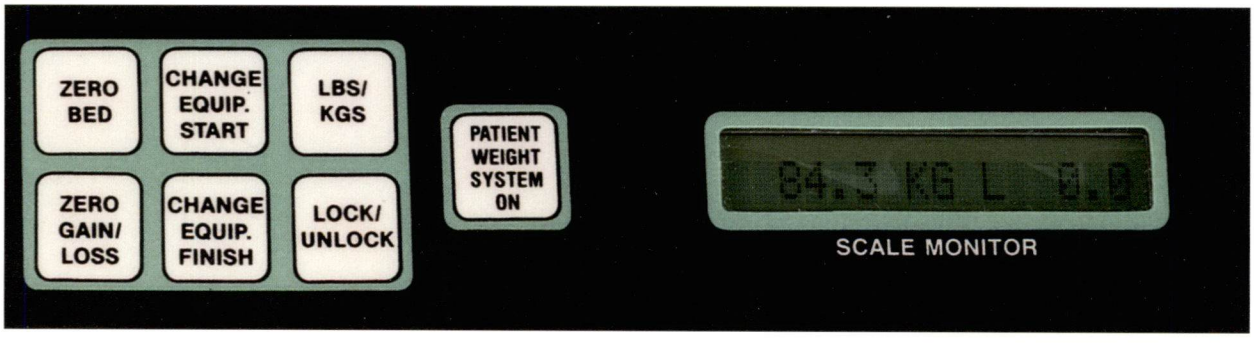




Hydraulic

The traditional, dependable hydraulics of Stryker technology offers you another method of operation for full patient positioning during transport. Foot pedals and cranks at the foot end are easily accessed and always available. A manual/hydraulic override system provides the back-up you need - when you need it.

Integrated Patient Scale System with Monitor Interface



A truly distinctive patient care innovation: Stryker's Renaissance Series Dual Control Critical Care Bed combines computer technology with astounding simplicity. The computer prompts you in clear, simple terms. The scale system weighs the patient while the bed is in any position. With attention to the details of your job, Stryker engineers have designed an exclusive Gain/Loss monitor within the system. This important feature measures and records patient weight gain or loss throughout the stay. The scale will weigh patients up to 500 pounds and will read in pounds or kilograms. Changing equipment poses no problem to the system, with a built-in feature that allows you to add or subtract equipment to the bed without affecting weight reading. A **Scale Serial Port** may be integrated into the scale system to relay patient weight directly to the patient monitor.

PATIENT ENCLOSURE

Split/Fold Siderails

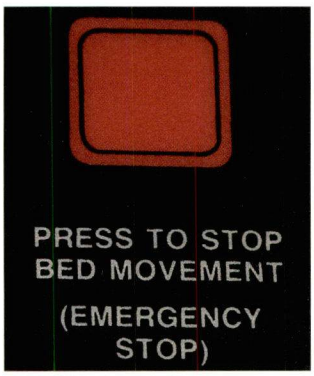
Keep your patient secure with the selected access feature of split siderails. Fold down one section at a time for the specific access you need. An added benefit for the patient is the ease of egress when using the siderails for support.

Fold Siderails

Our 16.5" high x 52.5" long siderails offer excellent patient enclosure, but collapse neatly down to allow access. Mid position provides access and protection. Bed may be built with a choice of folding direction - toward head end or toward foot end.

Safety Strips

Integrated safety strips in the Fowler and Knee Gatch areas detect any obstruction of eight ounces or more and stop bed motion.

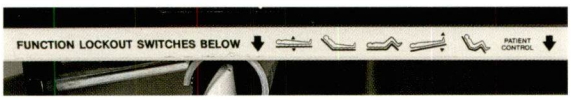


Emergency Stop

A keyboard button at the head end of the litter will immediately stop all bed motion.

Four Wheel Brakes

Stryker's braking system is truly the finest of the industry. One lever, accessible at both head and foot end, engages and disengages all four wheels. The coated solid steel rings firmly secure the wheels.

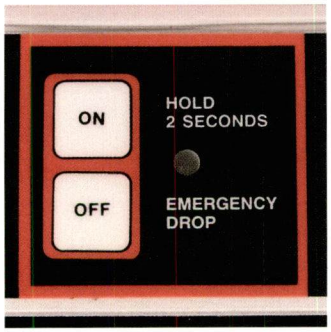


Function Lock-Out System

Each electric function of the bed can be activated or deactivated at the caregiver's discretion. The Function Lock-Out System prohibits unauthorized or inadvertent use of controls.

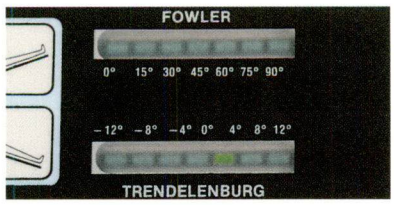
Dual Control Trendelenburg

The Stryker Renaissance Series Dual Control Critical Care Bed can achieve Trendelenburg by electric or manual operation. Both are rapid, one-step procedures. Manual operation is hands free; simply press a pedal. Electric operation is done with push-button ease. No minimum bed height is required for the electric method.



Emergency Drop

Push a button; the entire litter surface flattens. Fowler and knee sections lower, bed height lowers. For extra security, this function locks out all other electric bed operation (except scale) until the bed is reset.



MODEL 2020

Dual Control
Critical Care Bed

22.5" Low Height

Automatic Cardiac Chair

stryker®
Medical

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SERVICE

Open your financial options in capital investments. We'll customize a plan to fit your needs.

Consider an "HMO" plan for your equipment. A tailored Service Contract can protect and add life to your valuable investment.

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