avicenne MEDICAL

INFORMATION FOR GROWTH

www.avicenne.com

IMPLANTS

International conference on innovations & solutions for orthopaedic implants and orthobiologics

Created and chaired by avicenne MEDICAL

TUTORIAL – Contract Manufacturing Market

June 2015

CONTACT

Ali MADANI

Phone: + 33 1 47 78 46 00

a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

Table of contents

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Contract manufacturing market value chain

Contract Manufacturers

Implants

Instruments

Cases & Trays

Orthopaedic companies OEM

Revenues in 2014:
37.4 B US$

6 majors
Few 10 big challengers
Few 100 little size competitors

Hospitals & Clinics

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

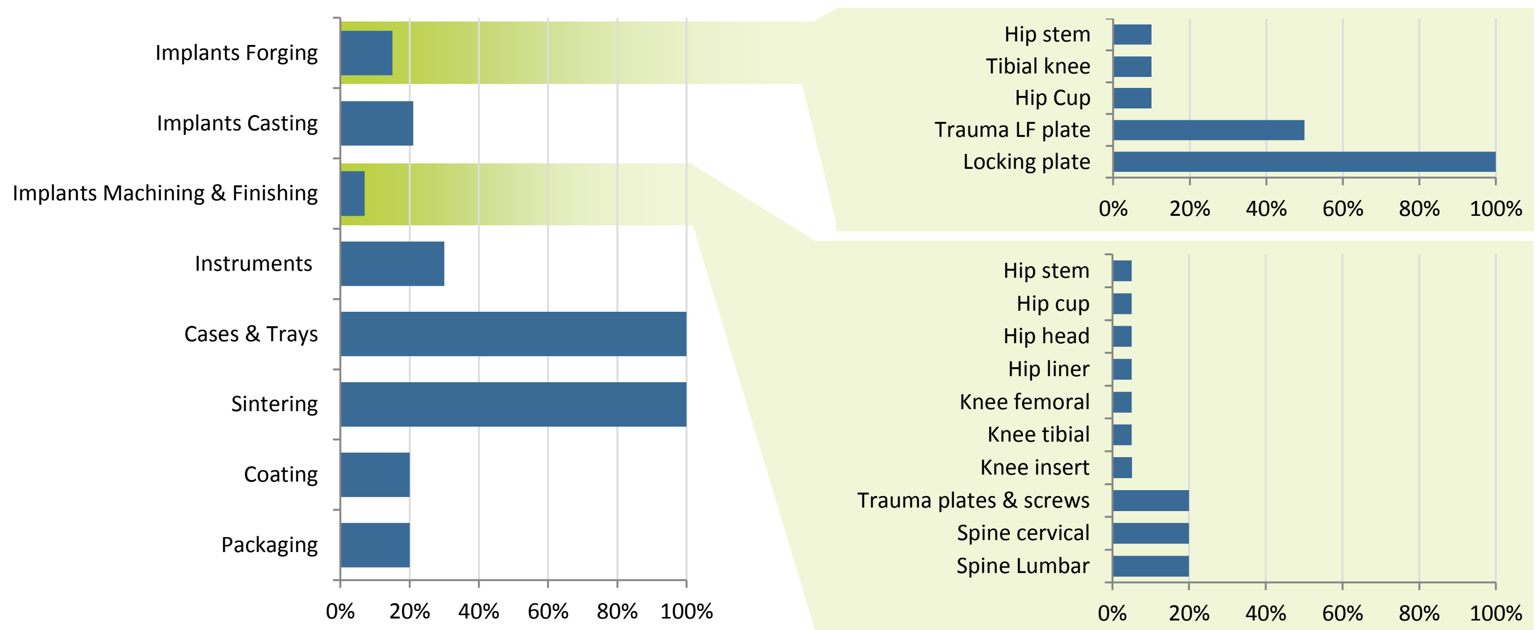
avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

OEM contract manufacturing strategy: Biomet

BIOMET

- **Casting:** Home-made → Fair-Lawn(USA)
- **Forging:** Berlin (Germany)
- **Machining & other facilities:** Warsaw(US), Berlin (Gr), Darmstadt (Gr), Bridgend & Swindon (UK), Valence (Fr), Valencia (Spain), Zhejiang & Changzhou (China), Irvine (US), Miami (US)

Contract Manufacturing Rate



Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

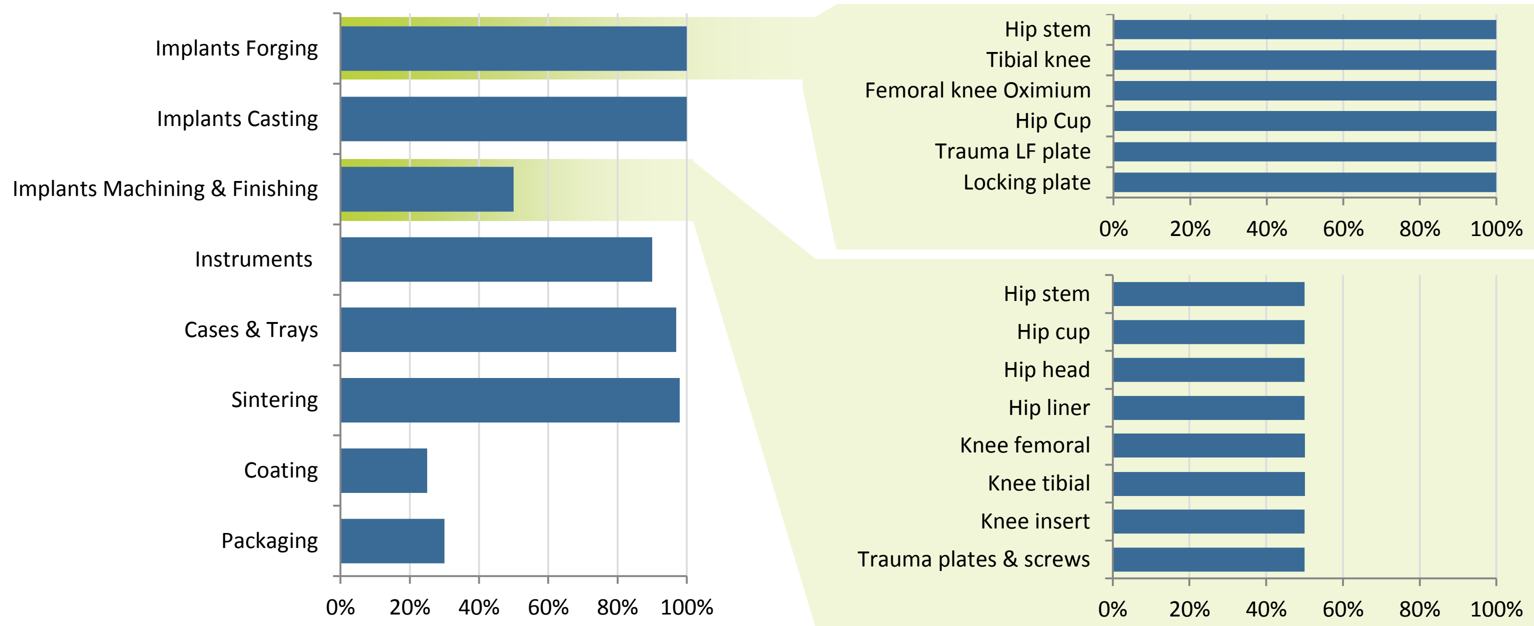
avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

OEM contract manufacturing strategy: Smith & Nephew

smith&nephew

- **Casting:** No home-made casting
- **Forging:** No home-made forging
- **Machining & other facilities:** Memphis(US), Aarau (Sw), Beijing (China), Warwick (UK), Tuttlingen (Gr), Mansfield (US), Oklahoma City (US), Calgary (Canada)

Contract Manufacturing Rate



Source: Avicenne 2015

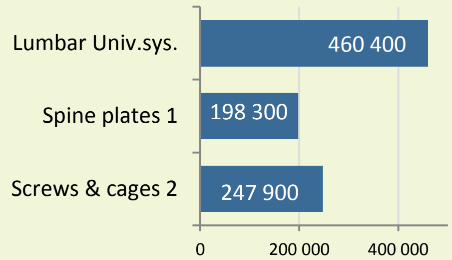
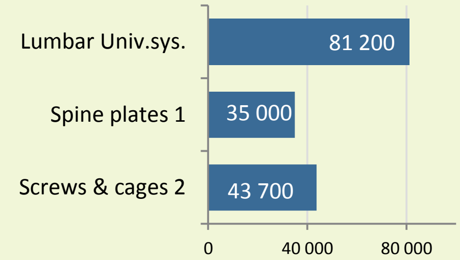
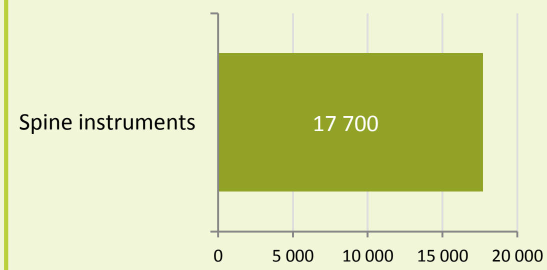
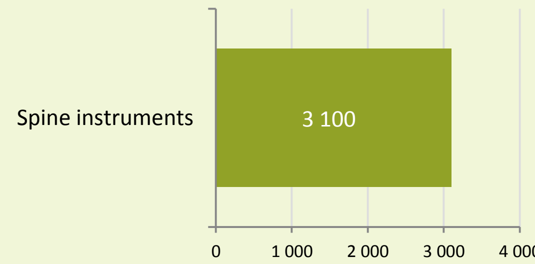
TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne
MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

OEM contract manufacturing strategy: Medtronic

	Home-made	Contract manufacturing
Medtronic Spine & Trauma machining		
Medtronic Instruments		
Medtronic Coating		

Nb of sets in 2014 — Nb of components in 2014

Source: Avicenne 2015

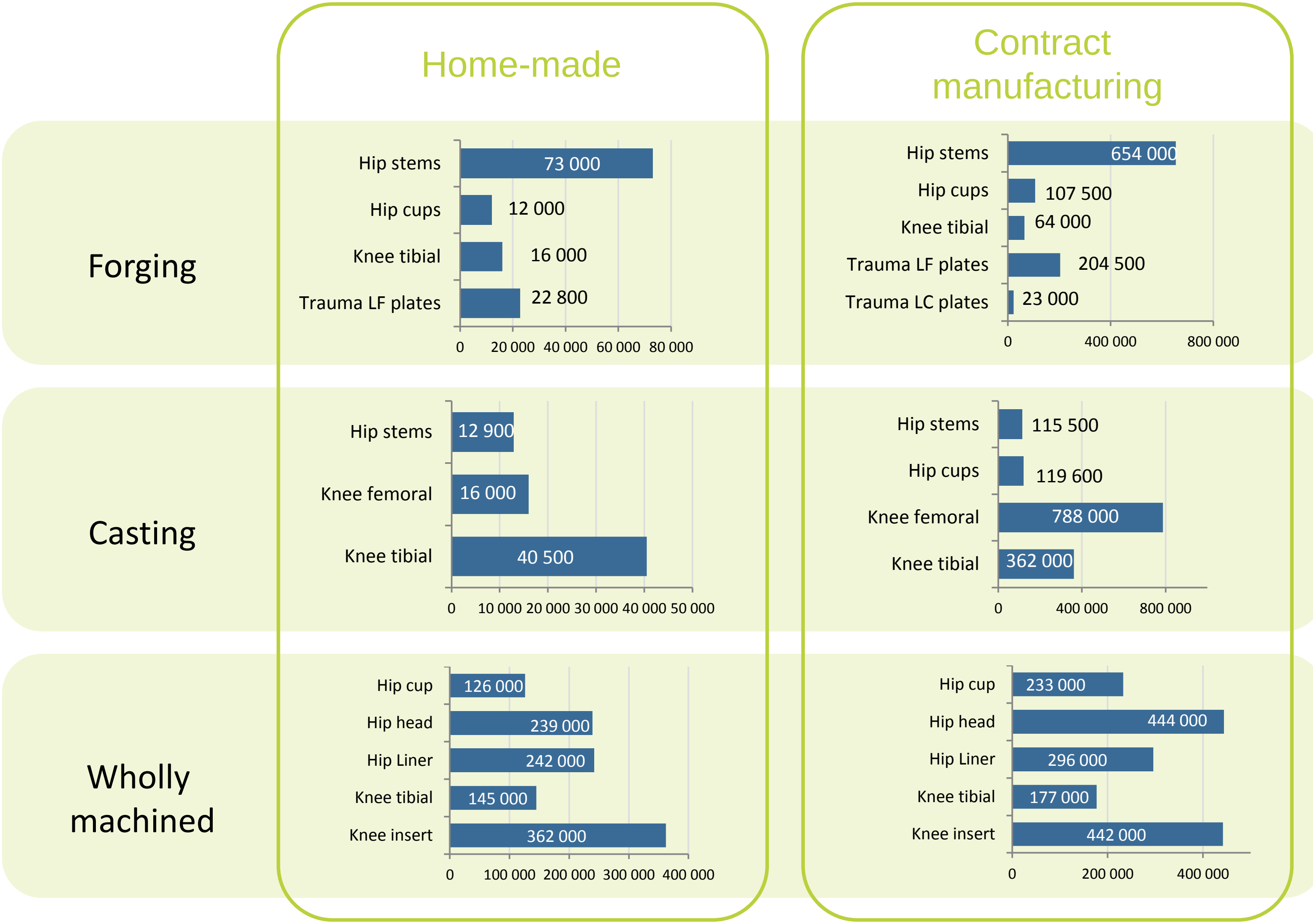
TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

OEM contract manufacturing needs: Challengers



Nb of components in 2014

Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Contract manufacturing product segmentation: 11 segments & 40 sub-segments

Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

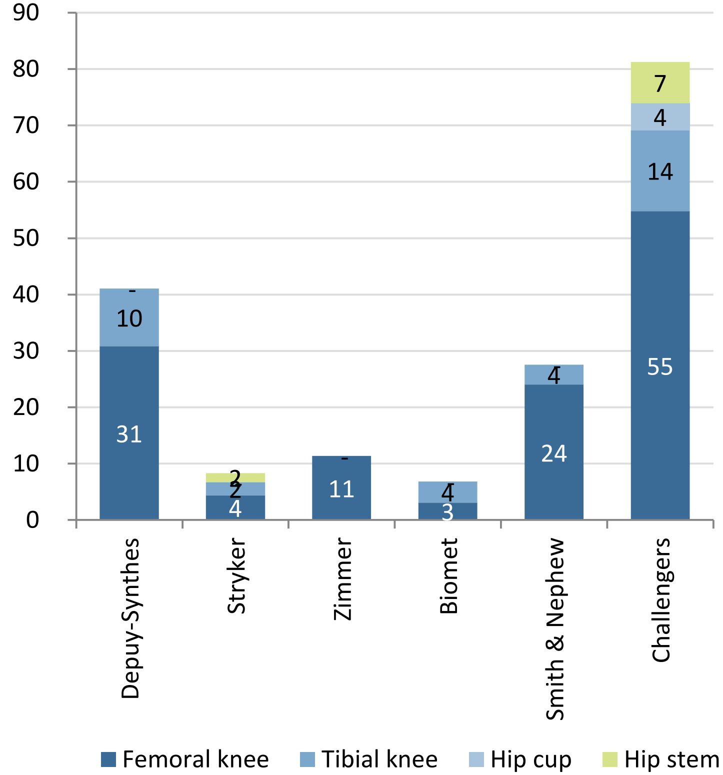
CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

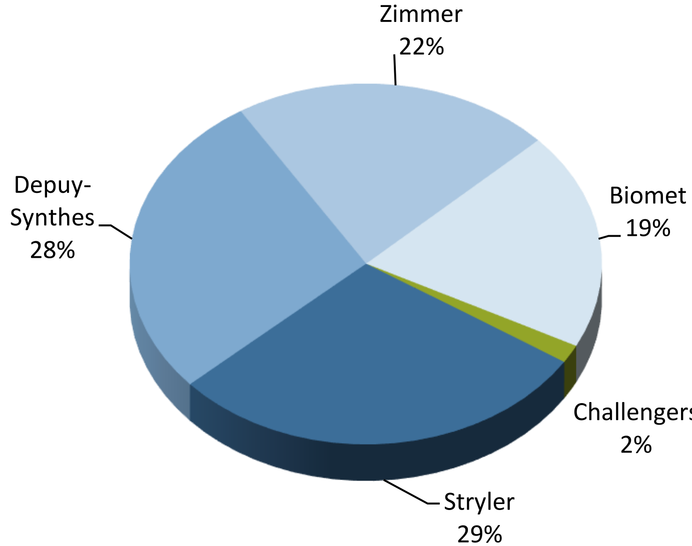
Casting: Home-made & Contract Manufacturing

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Contract Manufacturing
176 M US$



Home-made
240 M US$



Femoral knee is the most casted components.
The majors, except Smith, cast in-house their main needs

Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

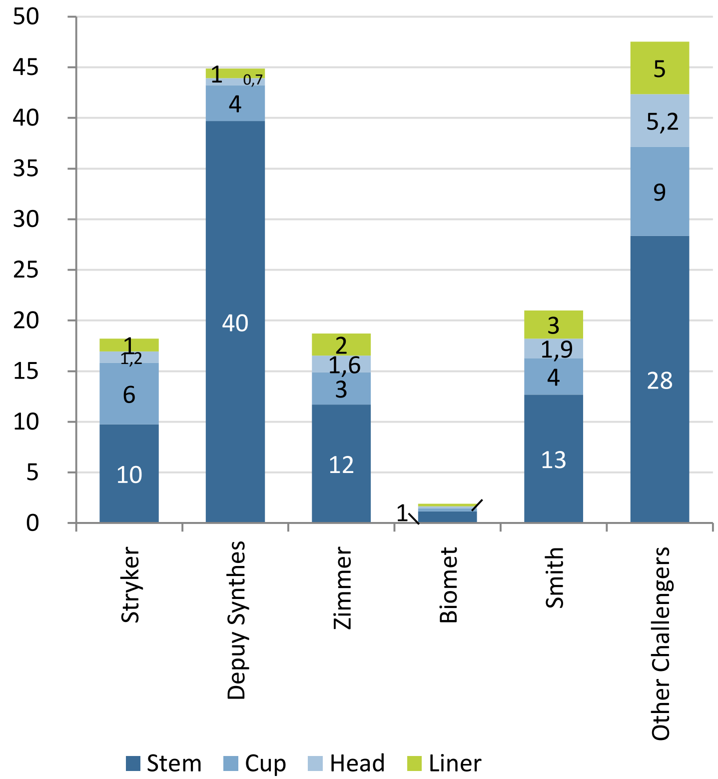
CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

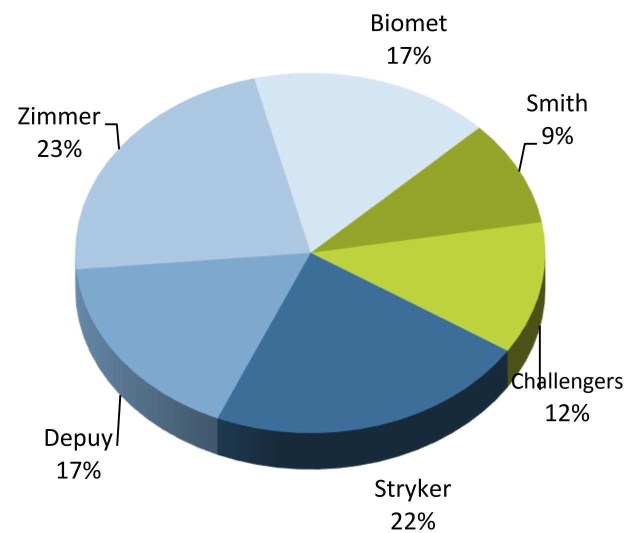
avicenne
MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Hip machining & finishing: Home-made & Contract Manufacturing

Contract Manufacturing
152 M US$



Home-made
236 M US$



Depuy-Synthes & challengers make more outsourcing than home-made. Liners &heads are often made in-house

Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

Knee machining & finishing: Home-made & Contract manufacturing

avicenne MEDICAL

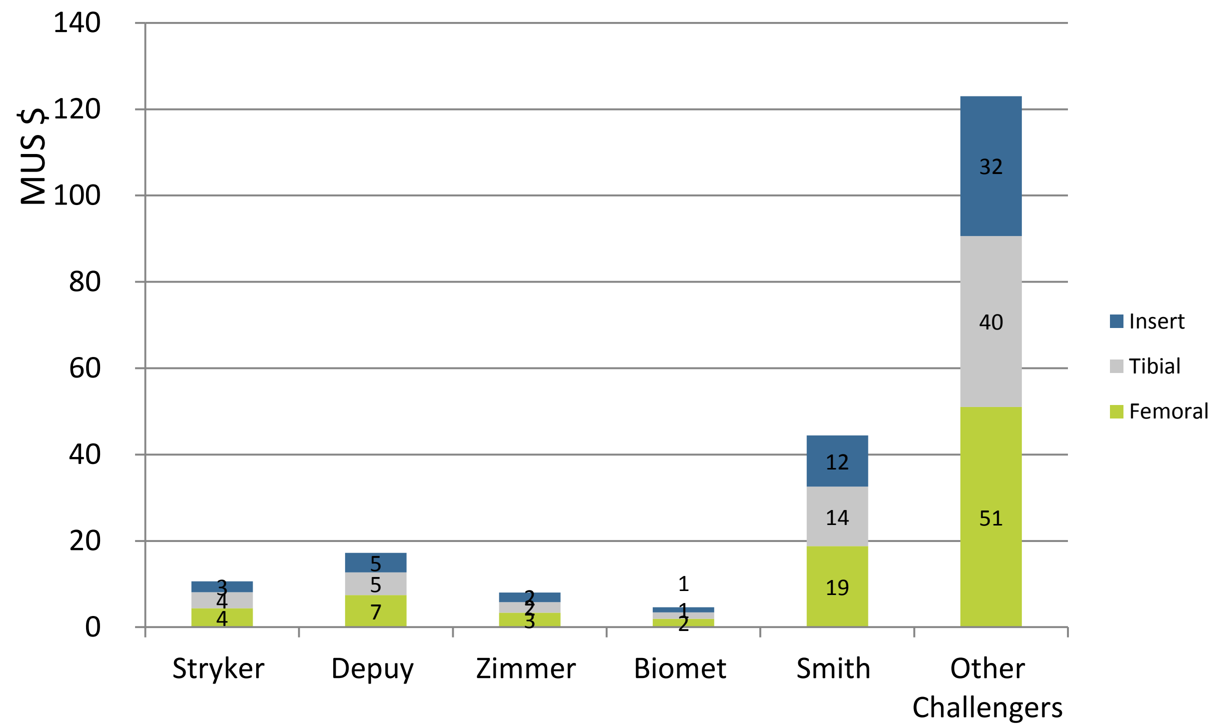
INFORMATION FOR GROWTH

www.avicenne.com

Except for challengers, knee machining is made massively in-house (because the femoral knee is casted in-house)

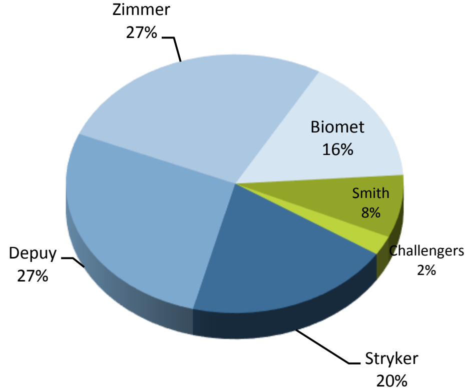
Contract Manufacturing

208 M US$



Home-made

654 M US$



Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

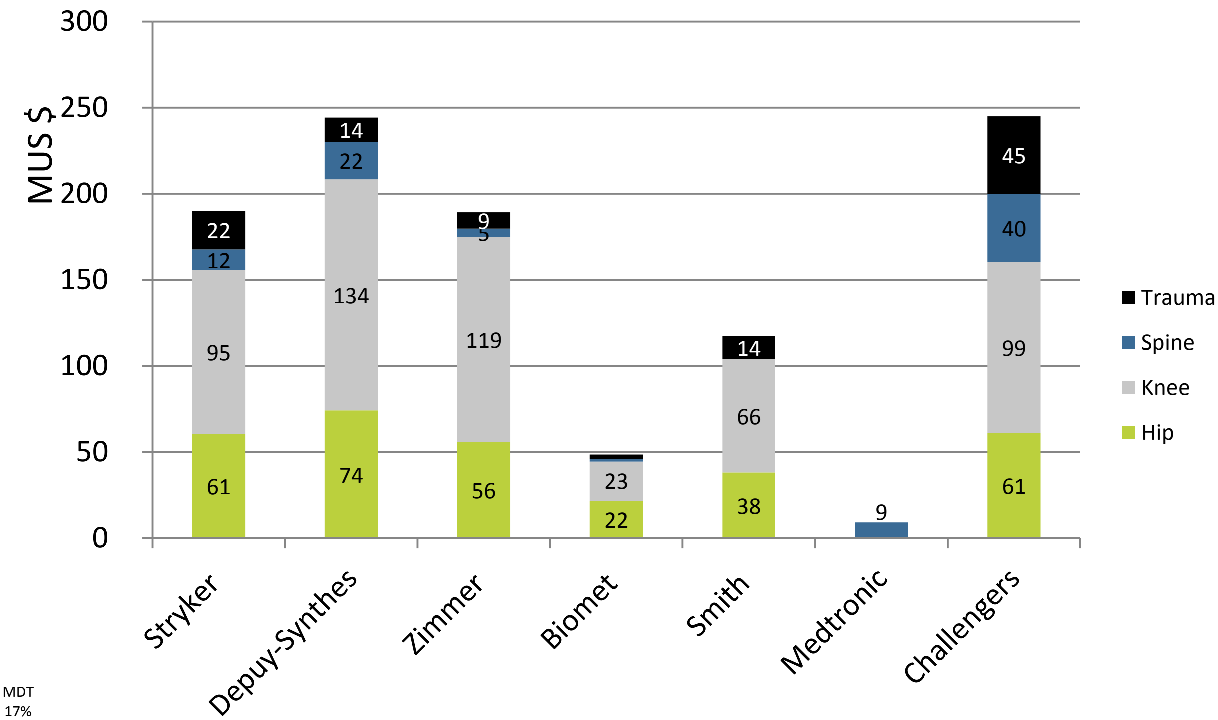
Instruments machining & finishing: Home-made & Contract Manufacturing

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Hip & Knee Instruments are massively outsourced except for Biomet (In-house Chinese production)
For Spine & Trauma, Depuy-Synthes & Medtronic making in-house

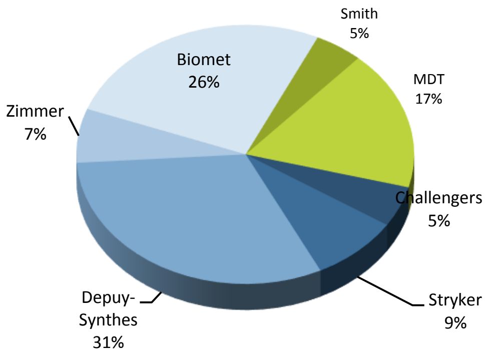
Contract Manufacturing

1043 M US$



Home-made

316 M US$



Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

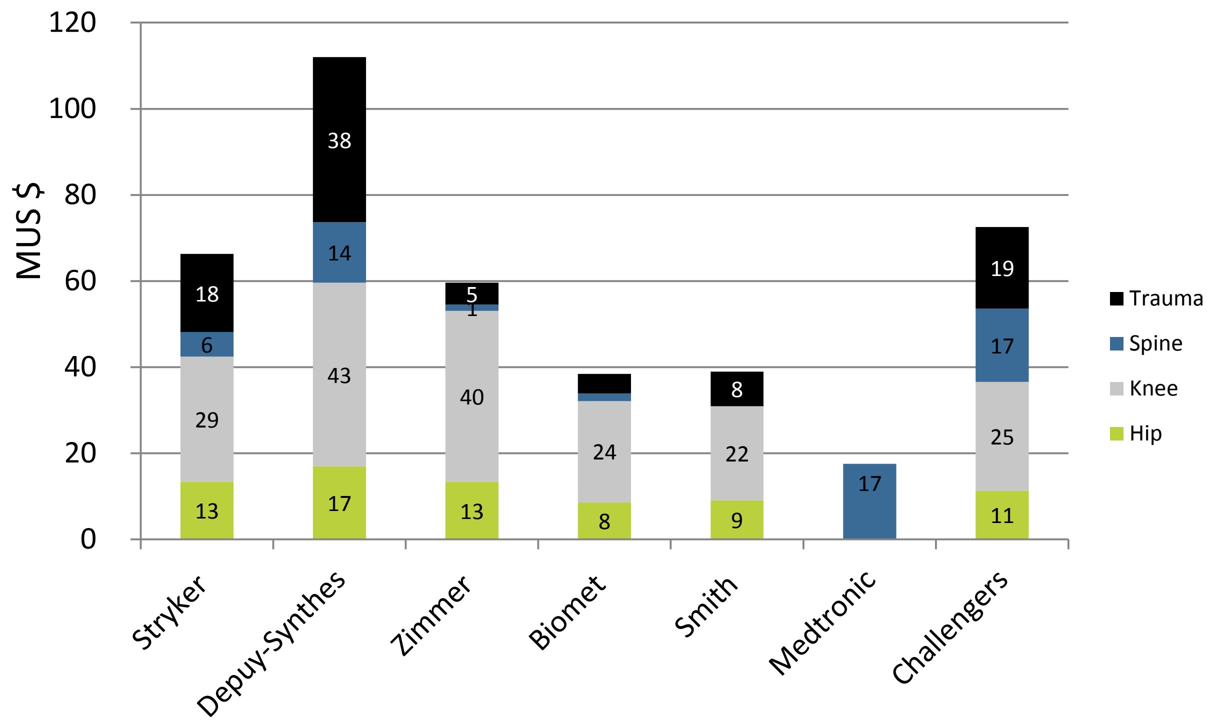
Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

Cases & trays: Home-made & Contract Manufacturing

Cases & Trays is an exclusive outsourcing market (> 95%). Very few challengers have their in-house production

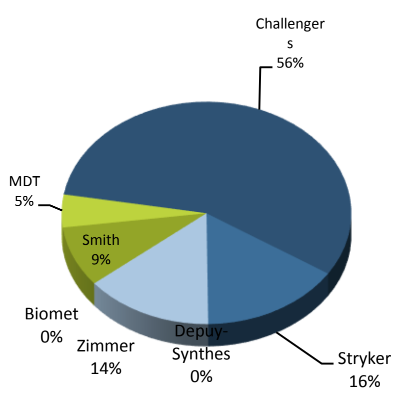
Contract Manufacturing

405 M US$



Home-made

15 M US$



Source: Avicenne 2015

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

TUTORIAL
Contract Manufacturing
June 2015

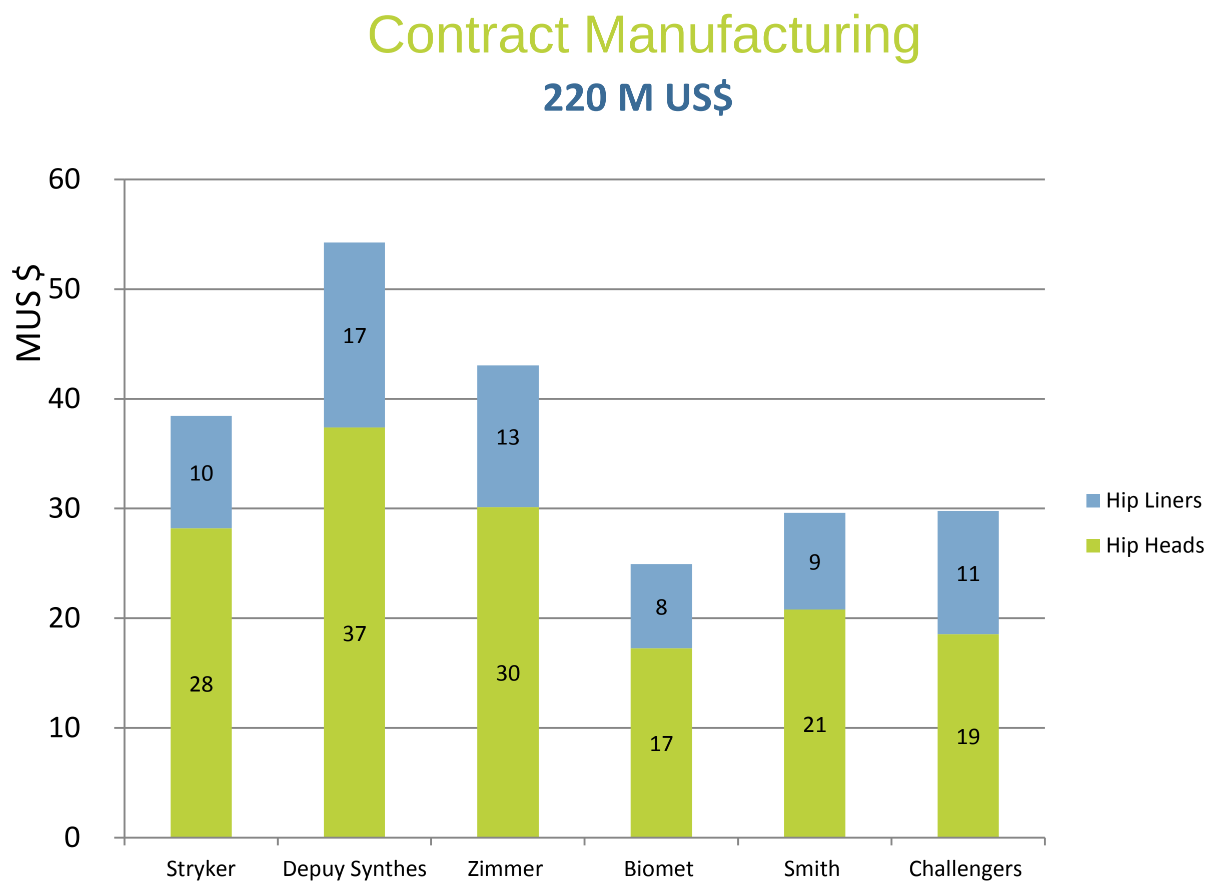
CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Ceramics: Contract Manufacturing

Almost all the Ceramics are outsourced. One company supply > 90% of this market.



Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

CONTACT
Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

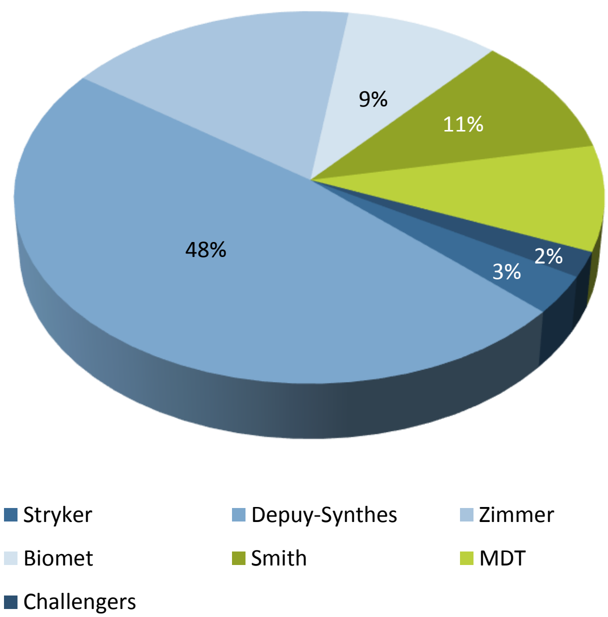
Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

MPS: Home-made & Contract Manufacturing

Home-made

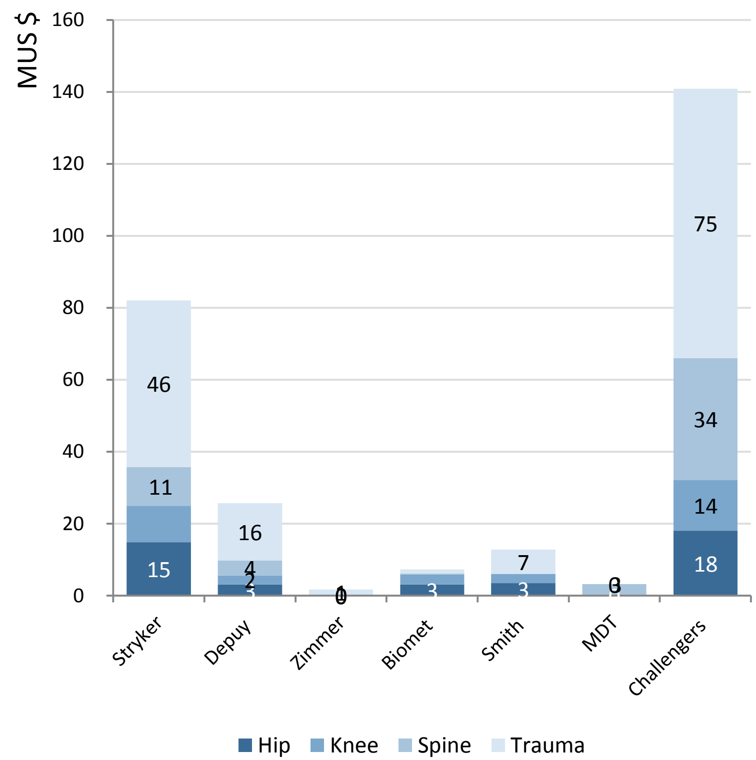
278 M US$

Except for Stryker, the MPS is made mainly in house by the Majors.



Contract Manufacturing

274 M US$

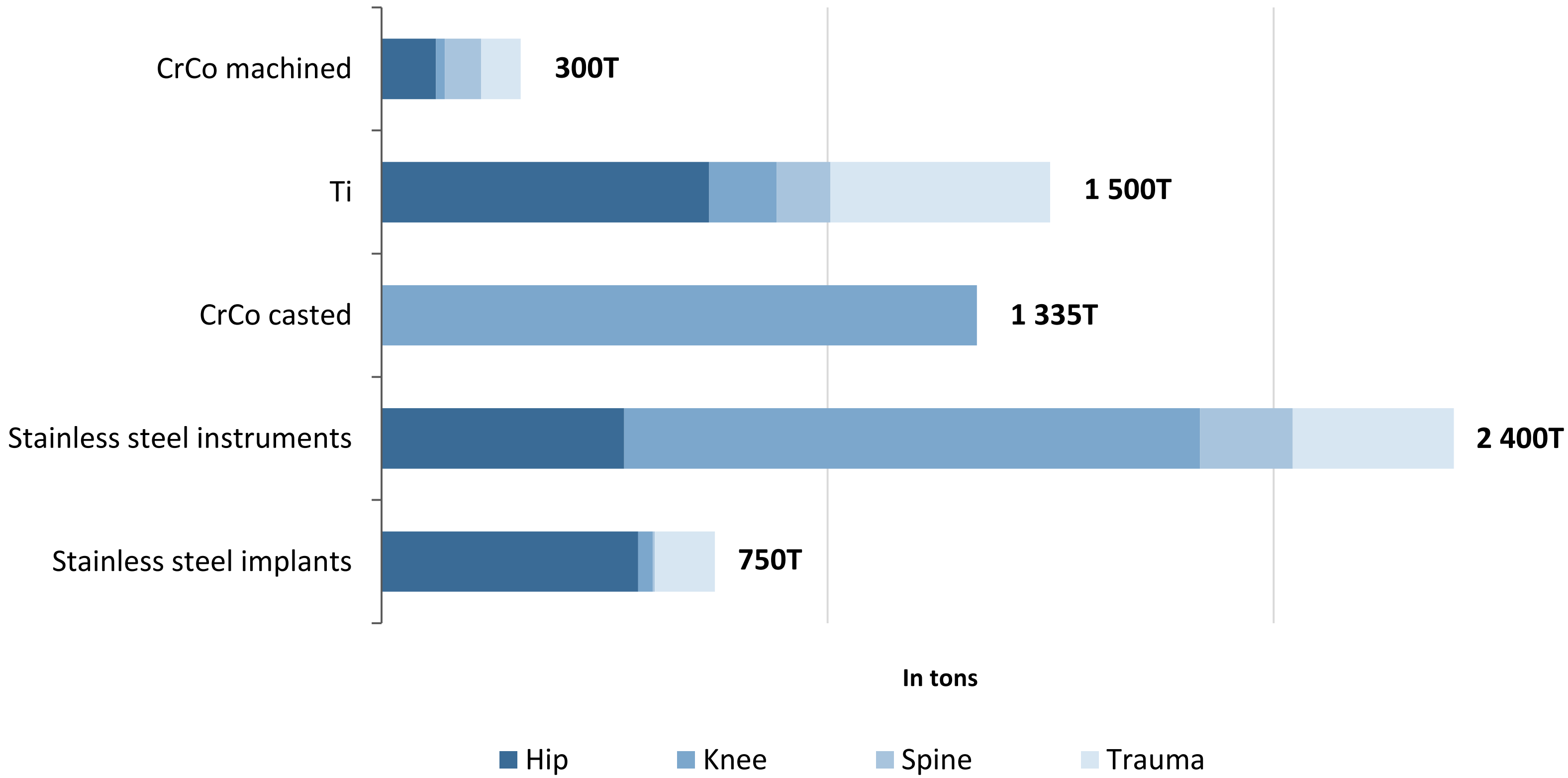


Source: Avicenne 2015

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Volume of Raw Materials used in hip, knee spine and trauma

Stainless steel is the most used materials: 2 400 Tons to manufacture instruments & 750 Tons for implants. Titanium is used for 1 500 Tons.



Source: Avicenne research & analysis 2014

TUTORIAL
Contract Manufacturing
June 2015

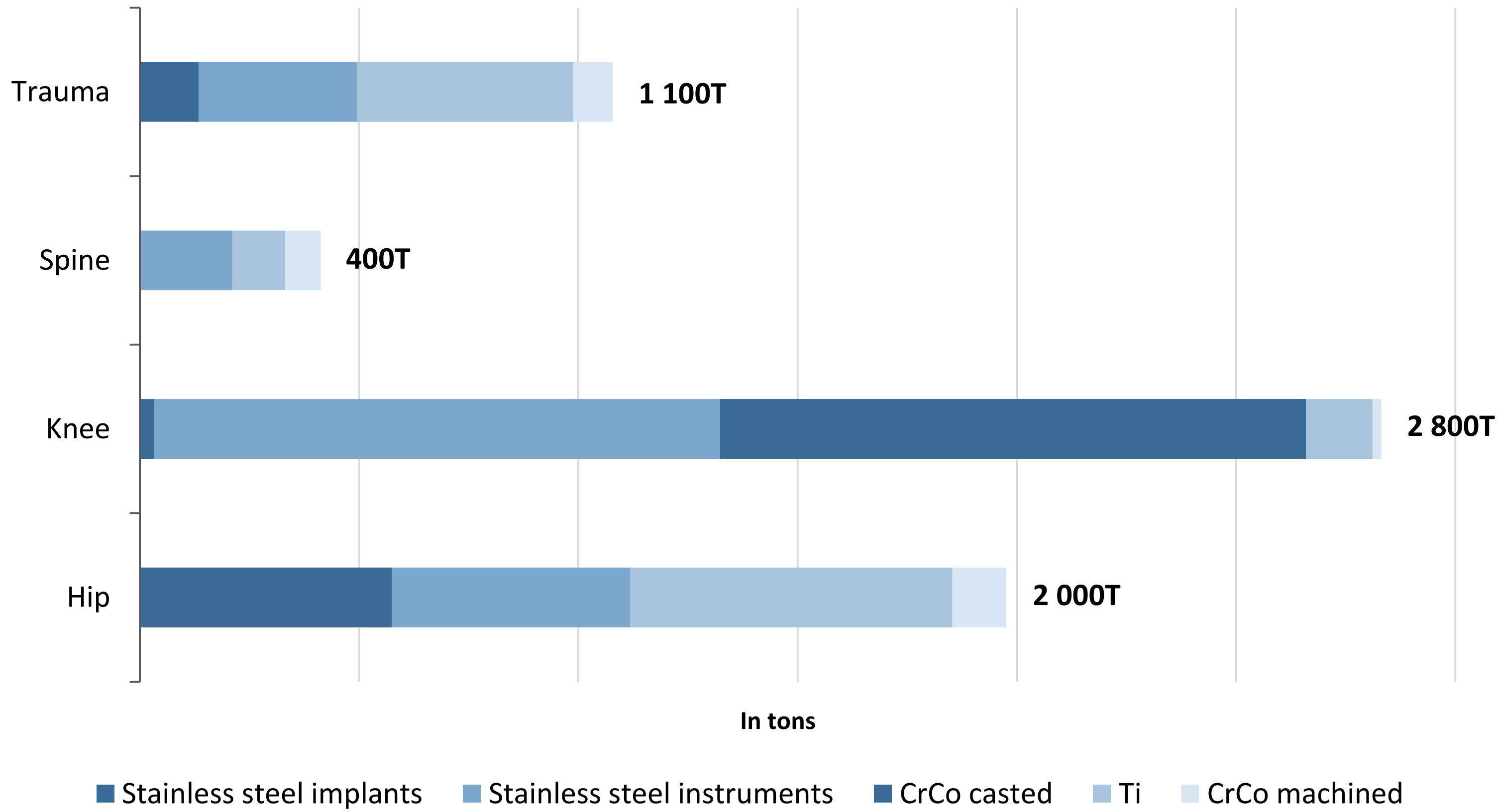
CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Orthopaedic Raw Materials market for hip, knee, spine and trauma

Hip and knee represent 76% of the total raw materials needs in volume.



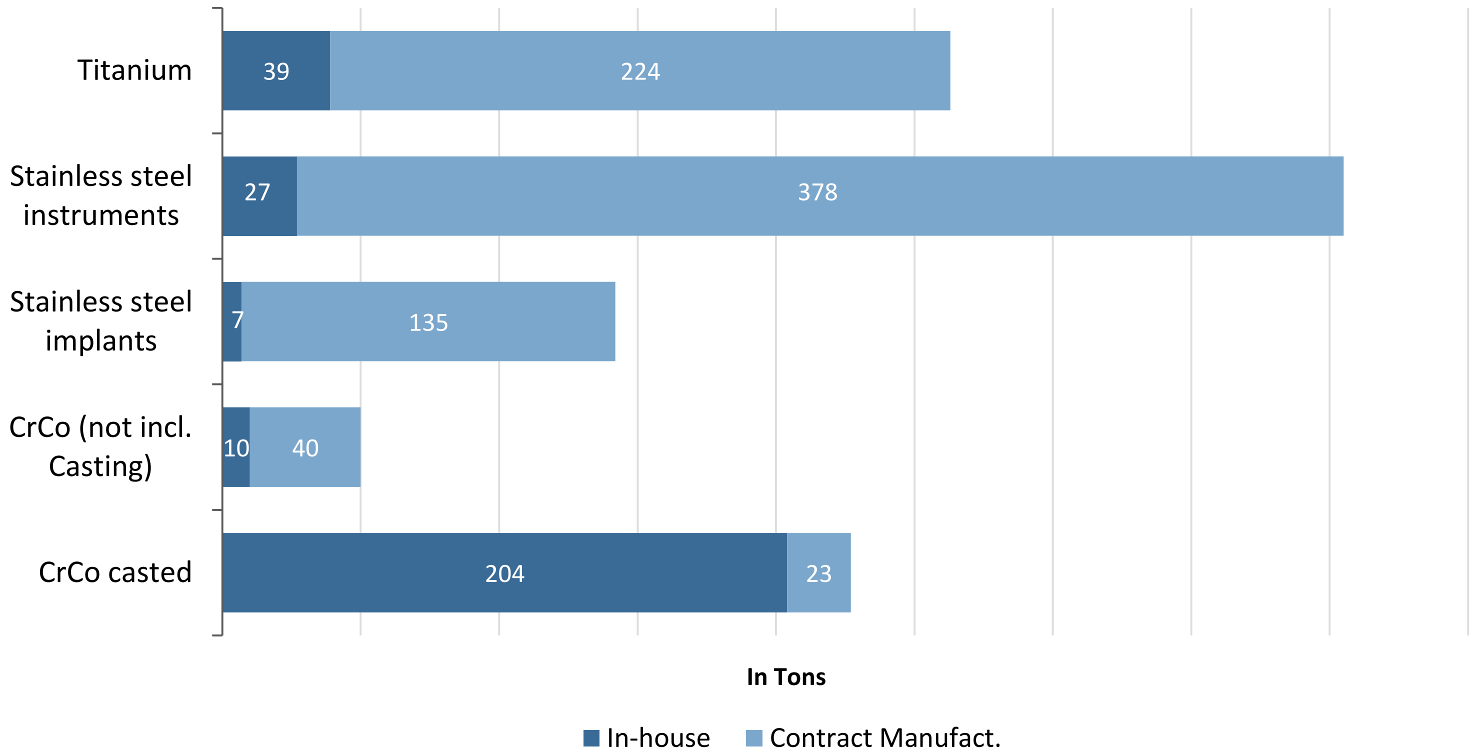
Source: Avicenne research & analysis 2014

TUTORIAL
Contract Manufacturing
June 2015

CONTACT
Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

OEM needs: example of STRYKER, summary



Source: Avicenne research & analysis 2014

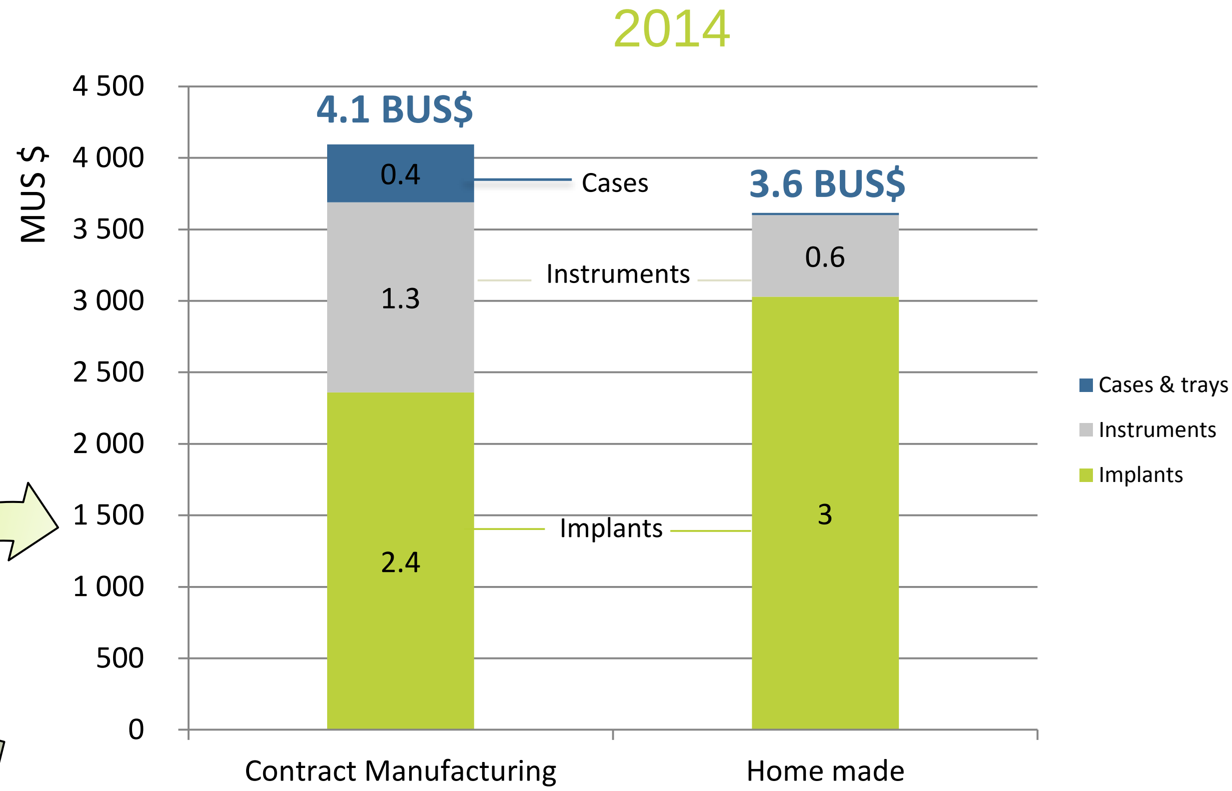
TUTORIAL
Contract Manufacturing
June 2015

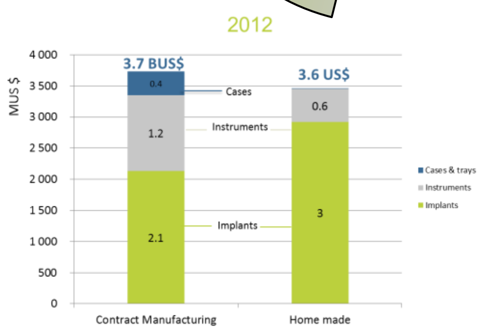
CONTACT
Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Orthopaedic contract manufacturing & home-made in 2014

The Contract Manufacturing grew, the home made stable between 2012-2014





Source: Avicenne 2015

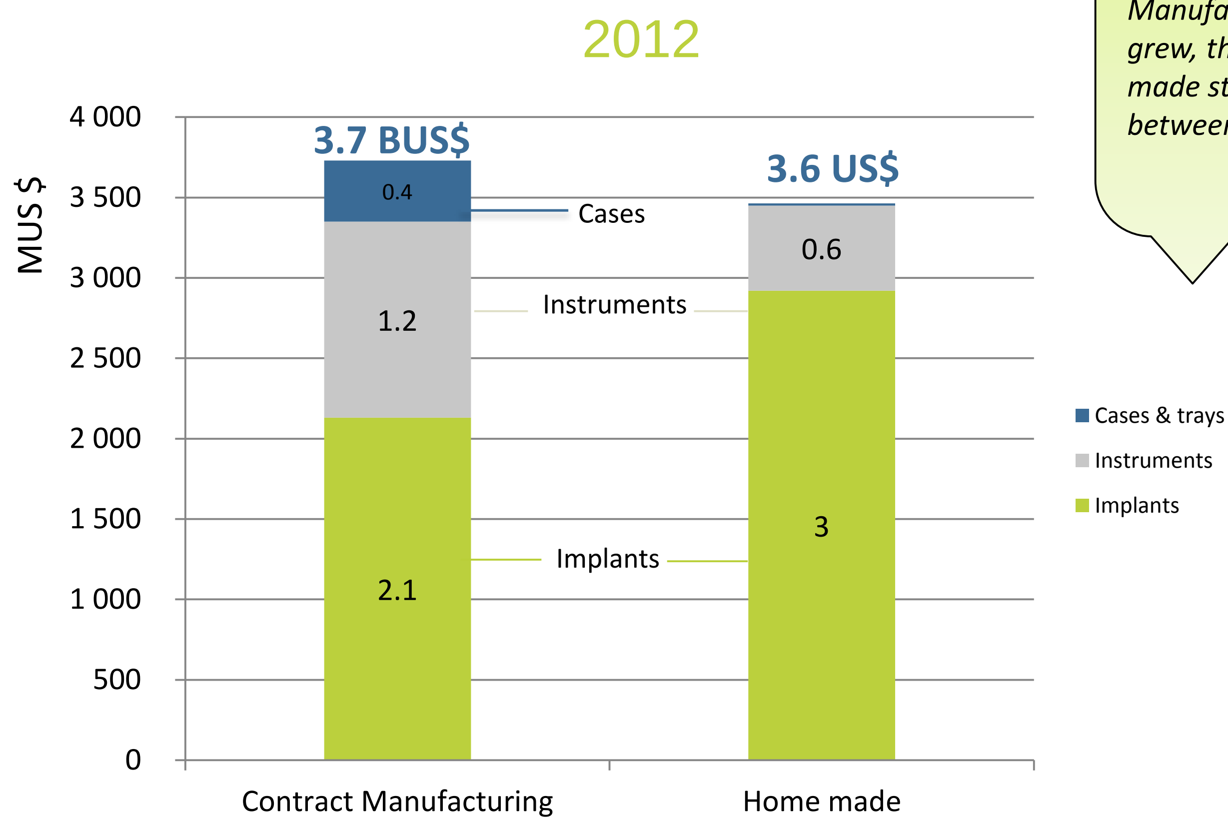
TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Orthopaedic contract manufacturing & home-made costs in 2012



The Contract Manufacturing grew, the home made stable between 2012-2014

Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Contract manufacturing market value chain

Contract Manufacturers

Implants
2.4 B US$

Instruments
1.3 B US$

Cases & Trays
0.4 B US$

Orthopaedic companies OEM

Revenues in 2014:
37.4 B US$

6 majors
Few 10 big challengers
Few 100 little size competitors

Hospitals & Clinics

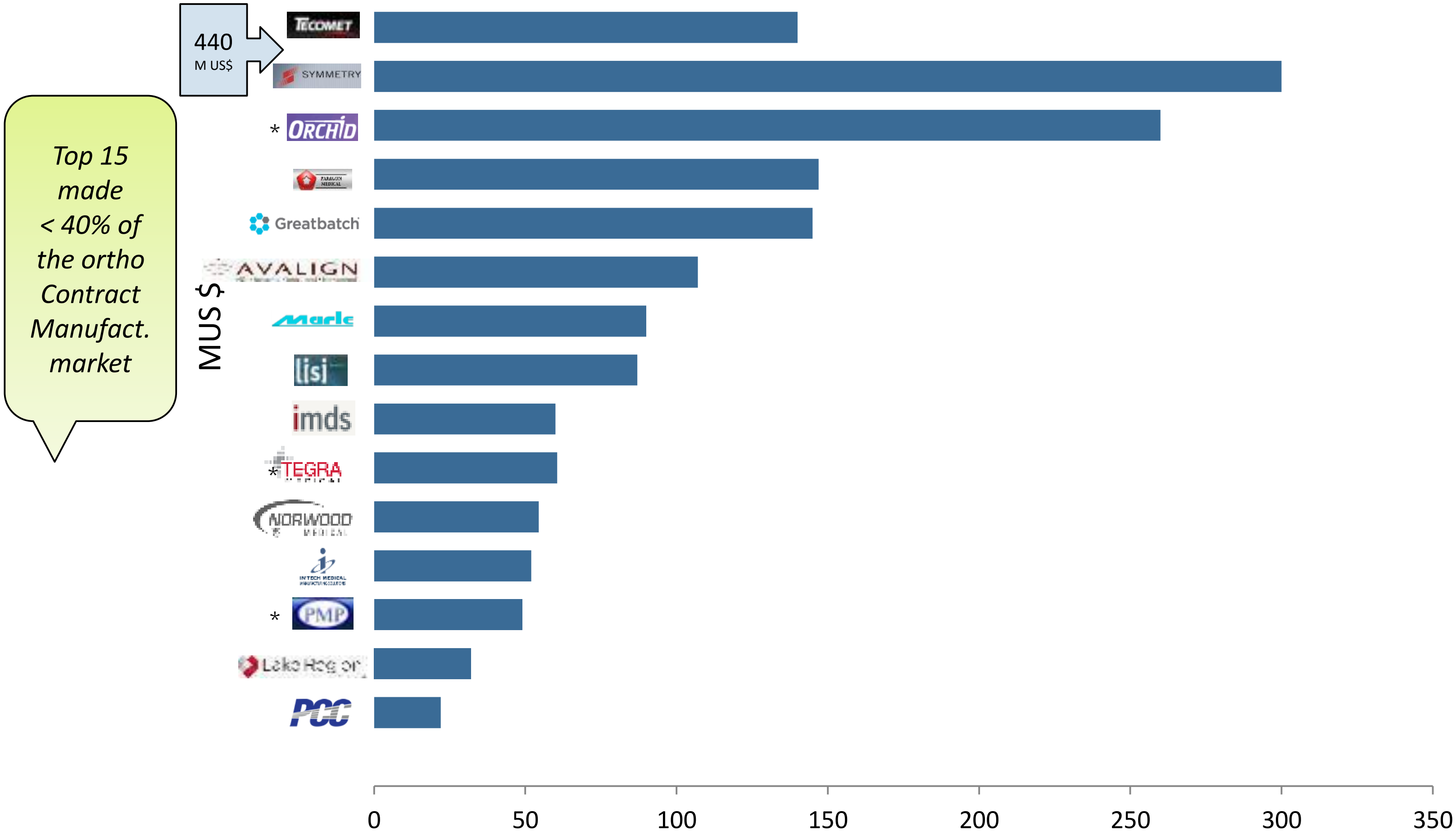
TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

Heavy trend, market concentration:

Contract Manufacturers worldwide revenues in 2014 (in M US$)



Source: Avicenne 2015

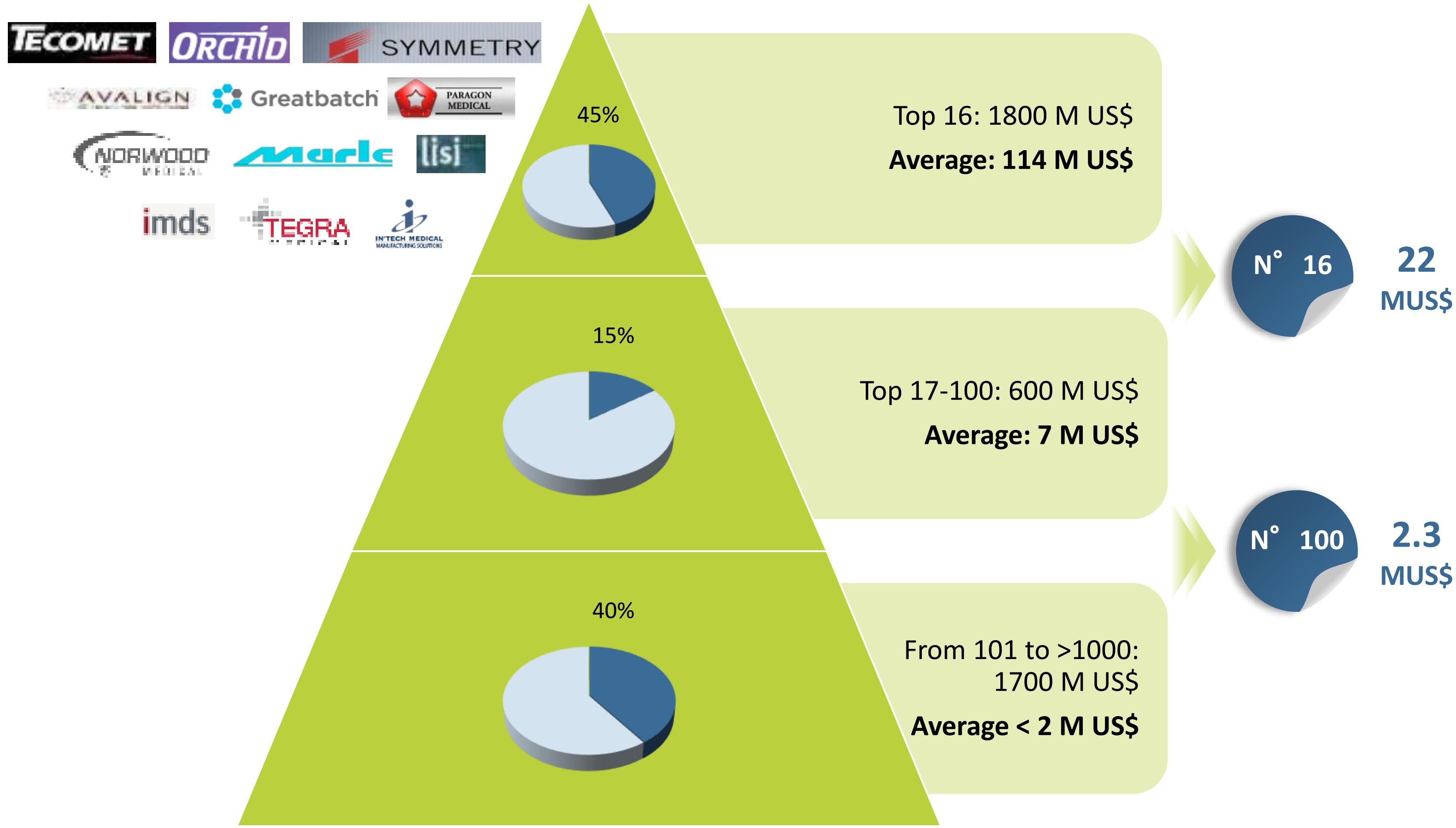
TUTORIAL
Contract Manufacturing
June 2015

CONTACT
Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

* Avicenne estimation

avicenne
MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Contract Manufacturing competitor ranking & dispersion



Source: Avicenne 2015

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Heavy trend: The OEM facility disinvestments

Even though it is being accomplished step by step, OEM facility disinvestments is a heavy trend.

Dec. 2007
Intech acquired Wright Medical facility in Toulon, France

Dec. 2007
Symmetry acquired Depuy Facility in New Bedford, USA

Feb. 2008
Greatbatch acquired Depuy facility in Chaumont, France

Feb. 2008
Sandvik acquired Medtronic facility in Memphis, USA

Sept. 2010
Lisi acquired the Stryker facility, Herouville, France

Feb. 2012
Symmetry acquired J&J surgical instruments business

TUTORIAL
Contract Manufacturing
June 2015

CONTACT
Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

The risk of moving to LLC by 2020: Developed countries & Low Labor Cost countries

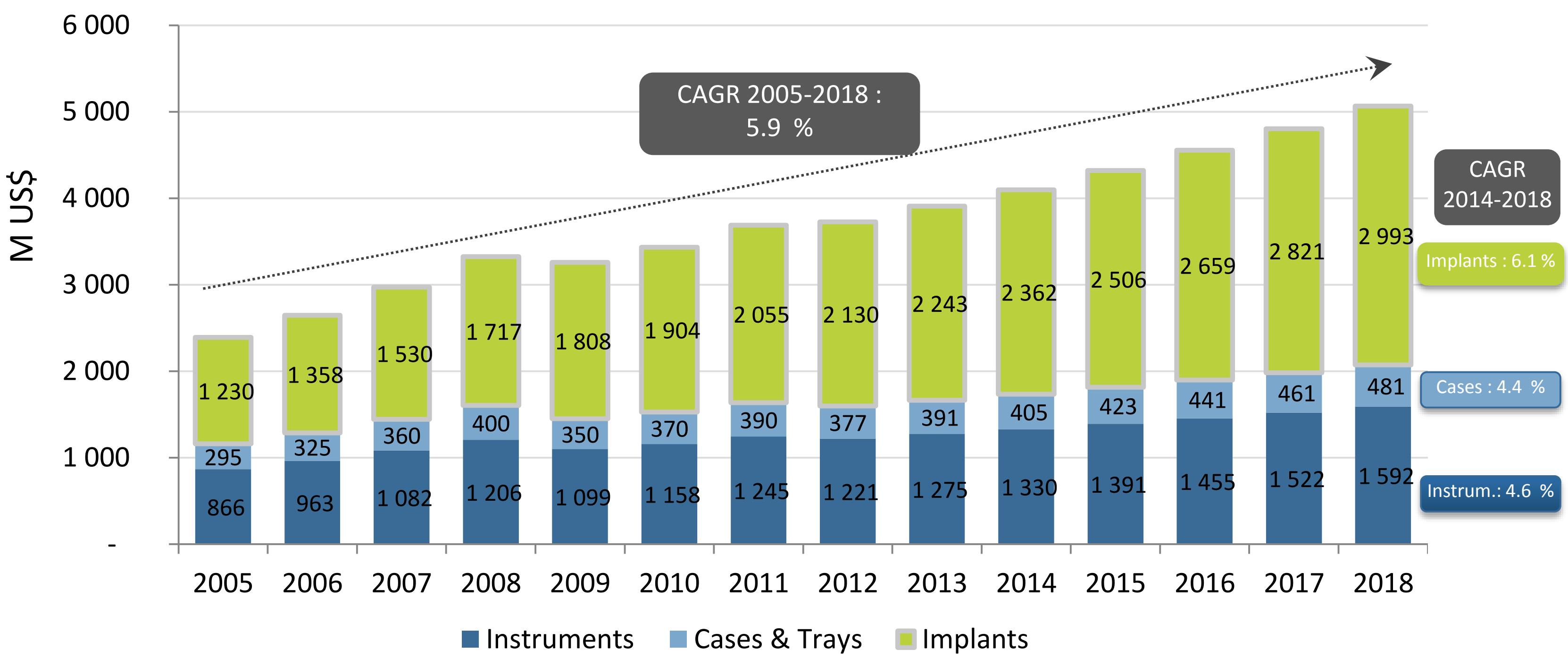
	Trend by 2020	Level of moving to LLC
Generic orthopaedic instruments	Massively outsource In LLC	
Complexes & customized Orthopaedic instruments	Massively outsource Stay in USA & Europe	
Implants forging & casting	Stay in USA & Europe More outsourcing for the Majors	
Implants hip & knee machining	Few % go to the major OEM facilities in LLC	
Spine & trauma implants machining	Depuy-Synthes & Medtronic will stay in house. Other players outsource more and more in LLC	

Source: Avicenne 2015

avicenne
MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Contract Manufacturing market historical revenues & forecasts (M US$)

Implants will grow more rapidly than the instruments & cases & trays.



Source: Avicenne research & analysis 2013

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Summary (1/2)

- To manufacture the implants, instruments & related products, the orthopaedic companies in 2014 spent, 3.6 B US$ in-house and paid their contract manufacturers 4.1 B US$.
- In the orthopaedic Contract Manufacturing market, Depuy-Synthes is the n° 1 customer. Depuy-Synthes, accounted for 860 M US$ followed by Stryker (730 M US$) , Zimmer (500 M US$) and Smith & Nephew (420 M US$).
- Biomet spent only 160 M US$ and Medtronic 100 M US$ because their manufacturing strategy is mainly oriented to in-house made. All the challengers accounted for 1.3 B US$ due to their higher rate of outsourcing.
- Instruments are the largest segment, with revenues of 1.3 BUS$ for the contract manufacturing followed by spine & trauma machining (890 M US$) and cases & trays (405 M US$). Forging contract manufacturing accounted for 400 M US$ & casting for 152 M US$.
- OEMs are requiring their Contract Manufacturers to reduce costs and sometimes to follow them to certain LLC countries to set up facilities there.

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com

avicenne
MEDICAL
INFORMATION FOR GROWTH
www.avicenne.com

Summary (2/2)

- The Majors want to drastically reduce the number of their Contact Manufacturers. The response to this need is Contract Manufacturing market concentration.
- The risk of moving to LLC countries will be mainly limited to Generic instruments and spine & trauma implants machining.
- Even though it is being accomplished step by step, OEM facility disinvestments is a heavy trend.
- Contract manufacturing market benefits from the main orthopaedic drivers, population ageing and product mix evolution. It also has its intrinsic drivers: OEM implants facilities disinvestments and the challenger's market share growth, which is drastically impacting this market, due to their high outsourcing rate.
- By 2018, the contract manufacturing market will grow faster than home-made.
- Contract manufacturing remains a robust market with 5.5% CAGR by 2018. Implants will grow more rapidly than instruments and cases & trays.

TUTORIAL
Contract Manufacturing
June 2015

CONTACT

Ali MADANI
Phone: + 33 1 47 78 46 00
a.madani@avicenne.com