Modern breast conservation

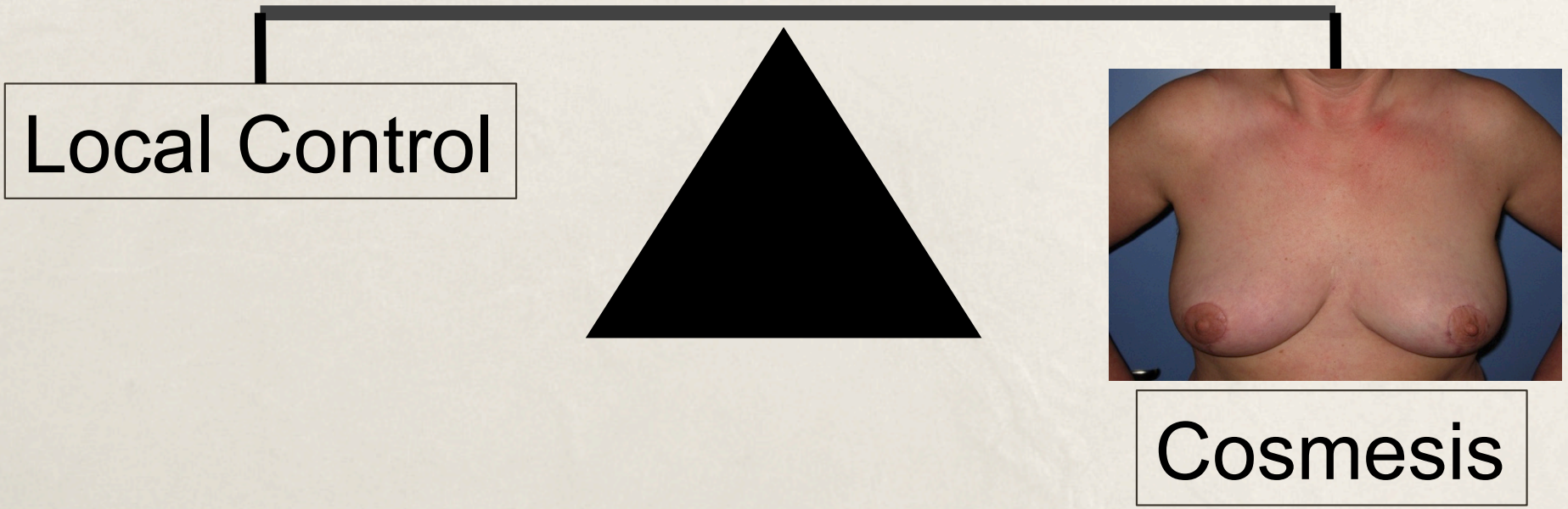
What is the role of oncoplastic breast surgery?

Symposium on breast conserving surgery versus mastectomy
Swedish Surgical Week 2018

Kristjan S. Asgeirsson
Consultant Oncoplastic Breast Surgeon
Nottingham Breast Institute/Nordic Breast Institute

Modern breast conservation

Oncoplastic breast conservation



Make BCS an option for more women

Research

Original Investigation

Effect of Breast Conservation Therapy vs Mastectomy on Disease-Spec

Shailesh Agarwal, MD; Lisa Pappas, MS;

Breast conserving therapy and mastectomy revisited: Breast cancer-specific survival and the influence of prognostic factors

ip M.P. Poortmans[6],

Available online at www.sciencedirect.com

ScienceDirect

EJSO 41 (2015) 1417–1422

EJSO the Journal of Cancer Surgery

www.ejso.com

Women treated with breast conserving surgery do better than those with mastectomy independent of detection mode, prognostic and predictive tumor characteristics

S. Hofvind [a,b,*], Å. Holen [a], T. Aas [c], M. Roman [a,d],

Breast conserving surgery versus mastectomy: overall and relative survival—a population based study by the Danish Brea Group (DBCG)

Peer Christiansen, Stina Lyck Carsten
Birgitte Offersen, Anne Bodilsen & Ma

Original article

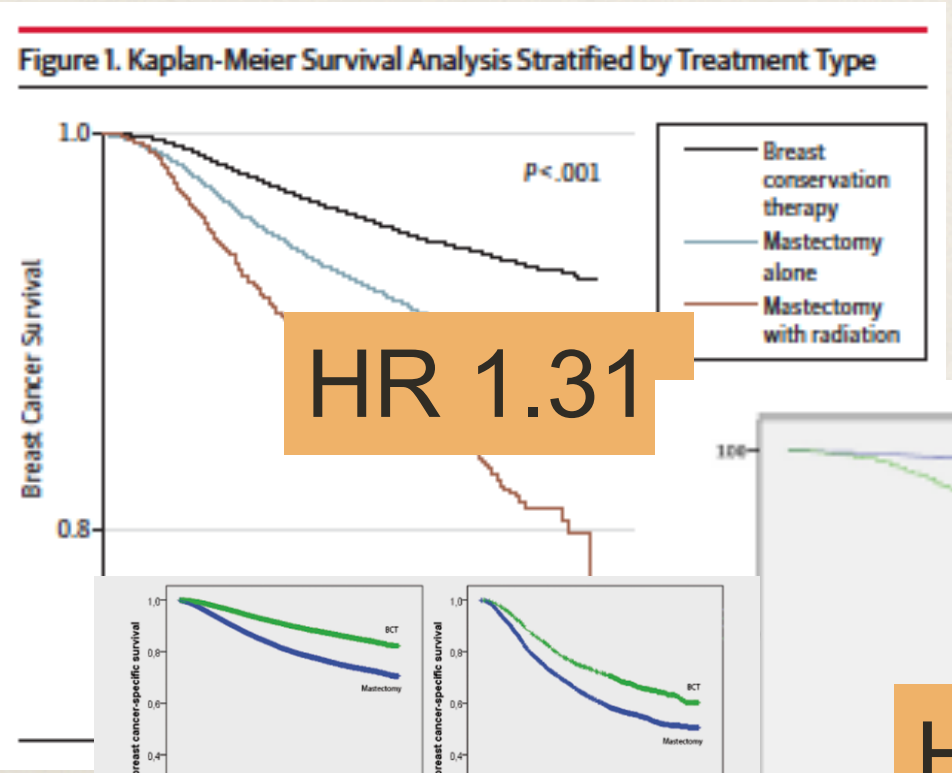
Breast-conserving surgery followed by whole-breast irradiation offers survival benefits over mastectomy without irradiation

J. de Boniface[1,2], J. Frisell[1,3], L. Bergkvist[4,5] and Y. Andersson[4,5]

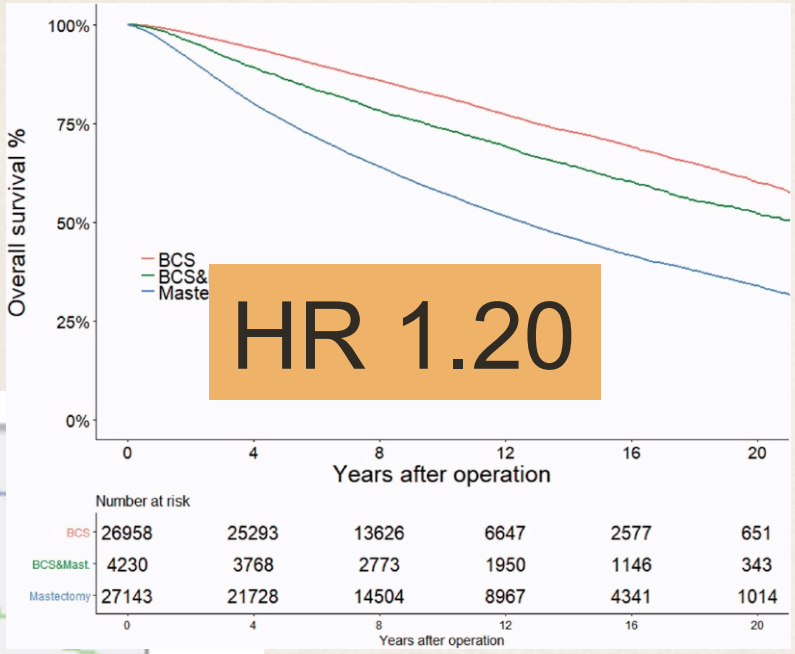
[1]Department of Molecular Medicine and Surgery, Karolinska Institutet, [2]Department of Surgery, Breast Centre, Capio St Göran's Hospital, and [3]Department of Breast and Endocrine Surgery, Karolinska University Hospital, Stockholm, and [4]Centre for Clinical Research Uppsala University, Västmanland County Hospital, and [5]Department of Surgery, Västmanland County Hospital, Västerås, Sweden

Correspondence to: Dr J. de Boniface, Department of Surgery, Breast Centre, Capio St Göran's Hospital, Sankt Göransplan 1, SE-11281 Stockholm, Sweden (e-mail: jana.de-boniface@ki.se)

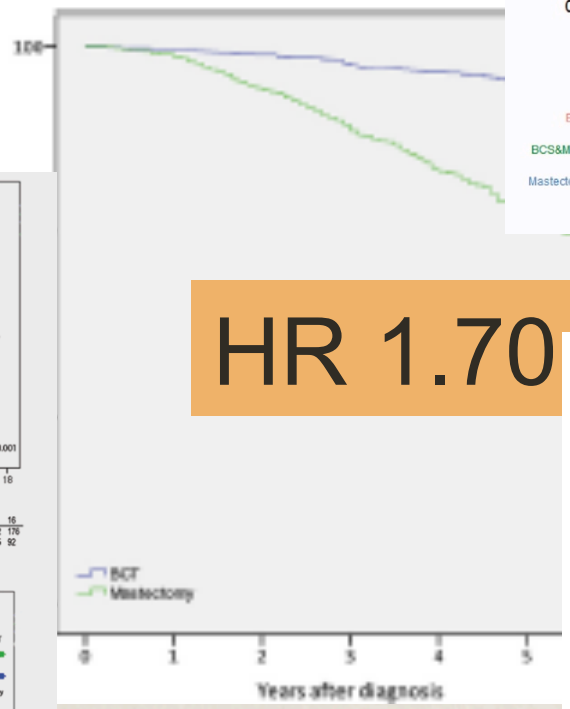
	N (%BCS)	When treated	F/U (yrs)	T2 (%)	% > 3cm	Reported LR/RR
US paper (2014)	120000 (70)	1998-2008	10	20 (2-4cm)	NR	No
Norwegian paper (2015)	9567 (62)	2005-2011	6	16.5 (T2-3)	NR	No
Dutch paper (2018)	Two cohorts 69311 (60)	2006-2012 cohort	10	22	NR	No
Danish paper (2018)	58311 (46)	1995-2012	11.5	22	4	No
Swedish paper (2018)	**2767 (66)**	**2000-2004**	**13**	**15**	**0**	**YES**



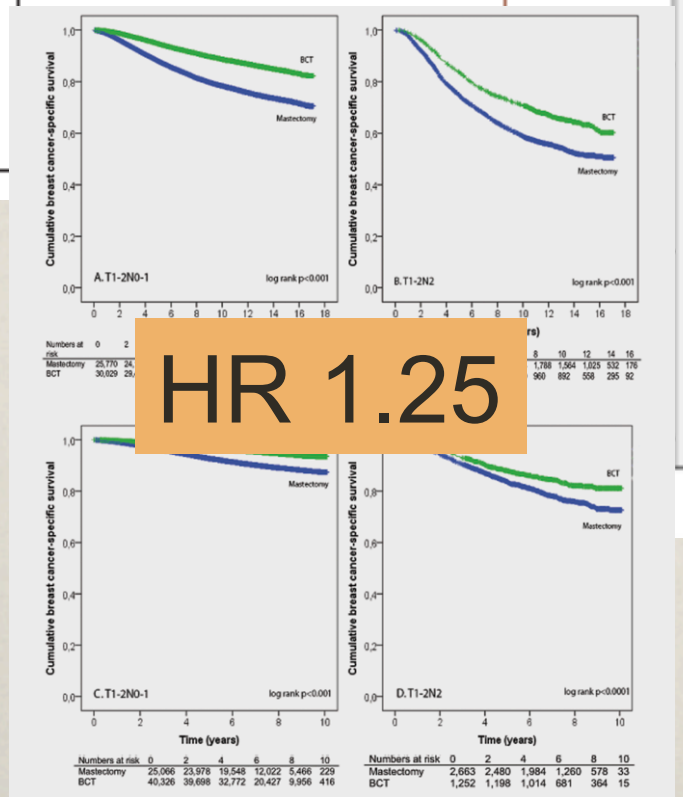
HR 1.31



HR 1.20



HR 1.70



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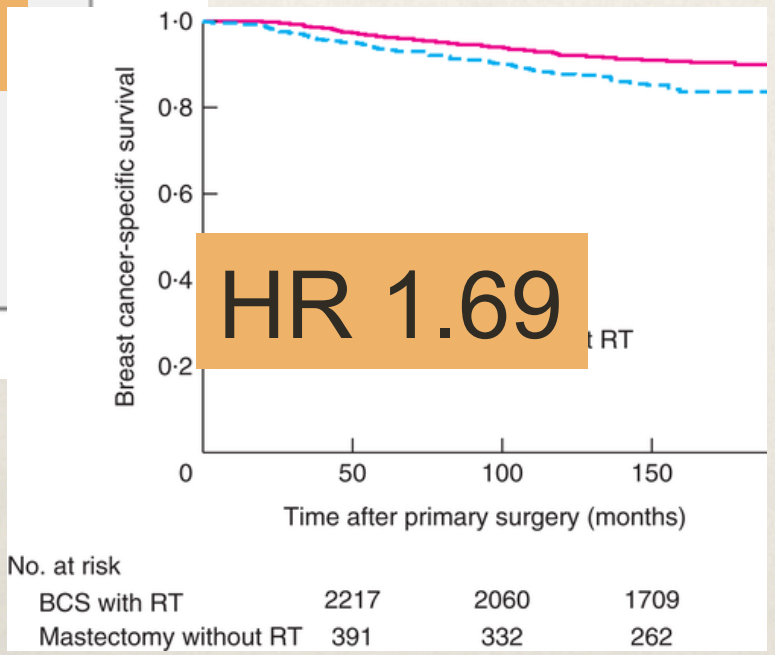
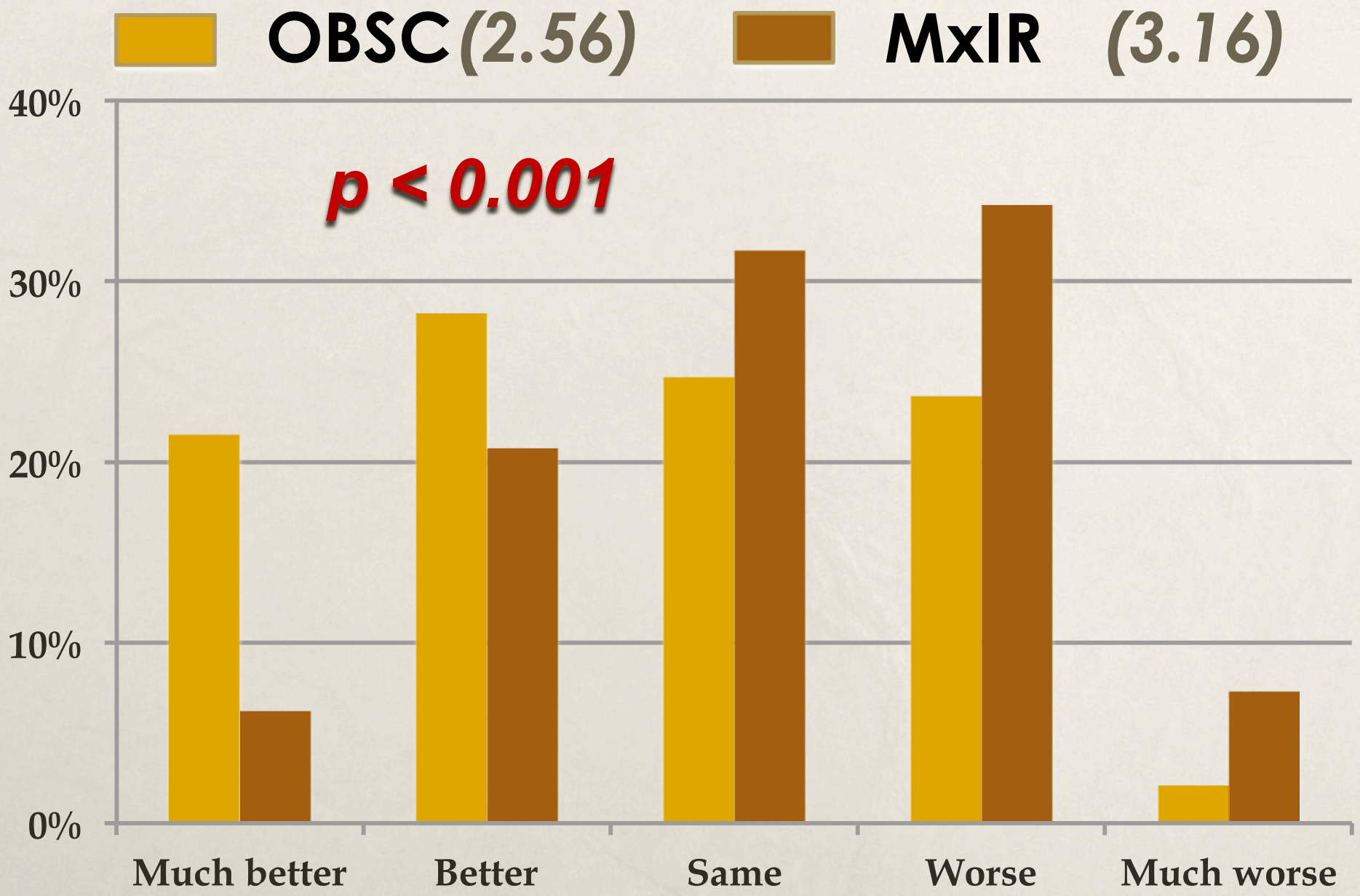


HR 1.69

WHAT DO YOU THINK OF THE APPEARANCE OF YOUR BREAST?



Cost-effectiveness of BCS vs Mx

Large Volume Displacement Oncoplastic Surgery Health States	Utility	Cost ($)	QALY*
Successful surgery	92.6	20782.00	33.43
Positive Margin:	70.0	$23851.71	33.41
Mastectomy with single stage direct implant			
Mastectomy with Single Stage Direct Implant Health States			
Successful surgery	69	14451.71	24.91
Revision surgery	61	17283.71	24.90
Implant capsular contracture	59	16479.71	24.90
Implant infection	59	23723.17	24.90
Seroma formation	64	17283.71	24.90
Hematoma formation	64	17283.71	24.90
Mastectomy skin necrosis	11	23723.17	24.86

*QALY, quality-adjusted life-years

Asban A, Homsy C, Chen L, et al. A cost-utility analysis comparing large volume displacement oncoplastic surgery to mastectomy with single stage implant reconstruction in the treatment of breast cancer. The Breast 2018

- BCS is better oncologically (at least for cancers 2-3cm)
- Patients having oncoplastic BCS have better PROMs compared to Mx and reconstruction
- Oncoplastic BCS is more cost effective compared to Mx and reconstruction

Why are we still offering mastectomy as an option if breast conservation is feasible?

Why are we not preferentially recommending breast conservation?

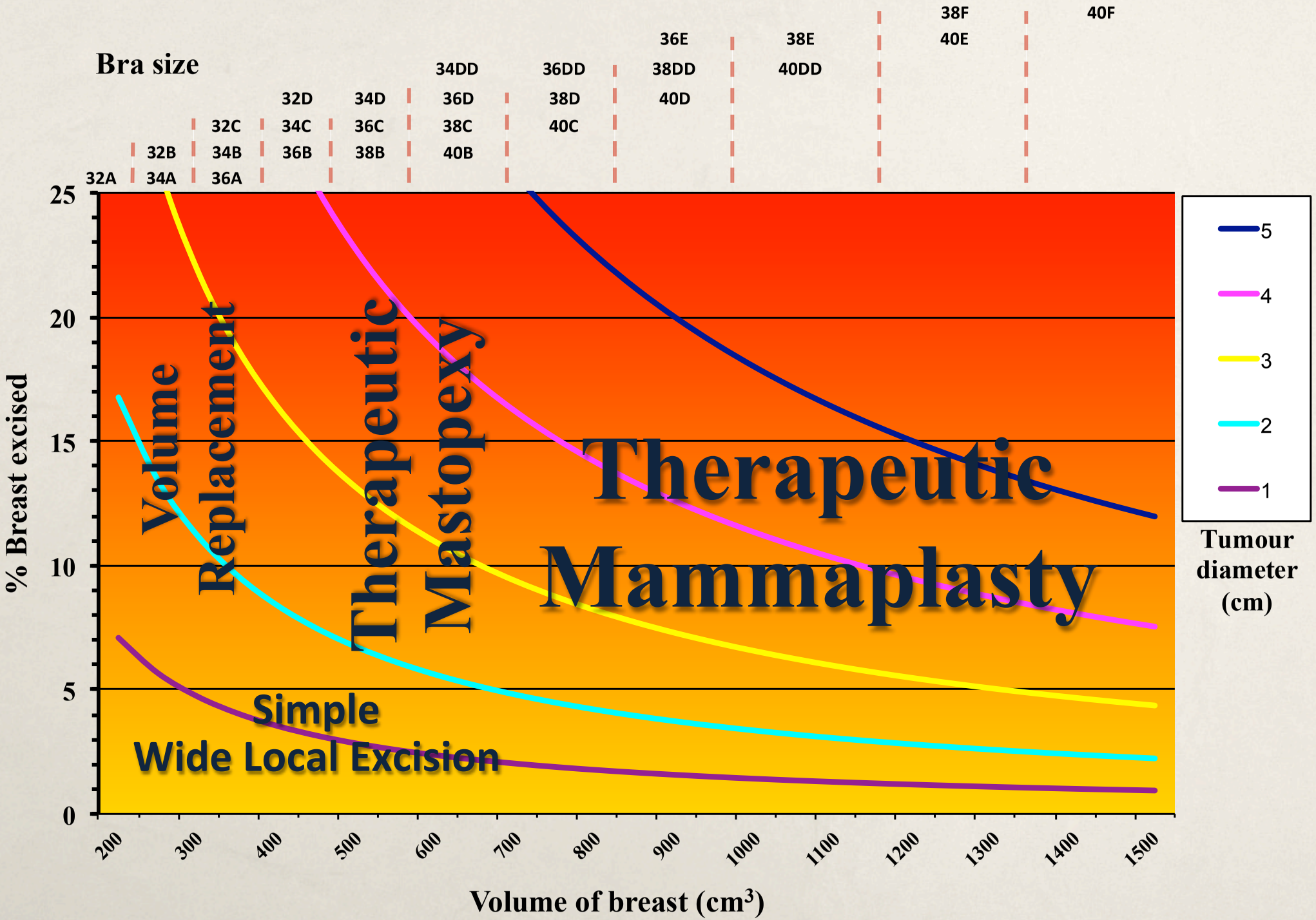
Modern breast conservation surgery **is** oncoplastic breast conservation

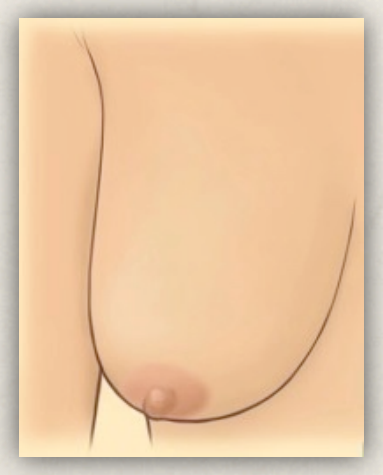
“All breast cancer surgery needs to be viewed as oncoplastic”

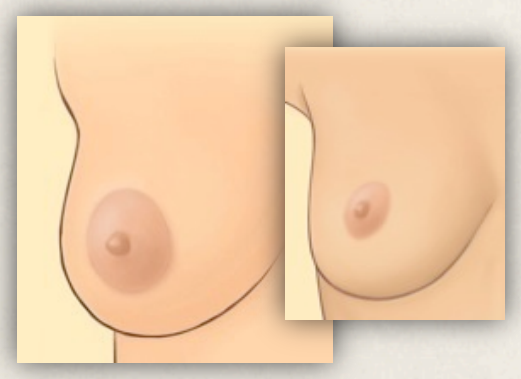
Why would anyone without aesthetic skills operate on the breast?

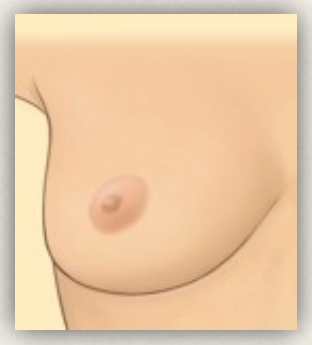
Why would anyone without oncologic knowledge operate on a breast cancer patient?

The Nottingham approach to oncoplastic breast conservation


Bra size
32A
32B
34A
32C
34B
36A
32D
34C
36B
34D
36C
38B
34DD
36D
38C
40B
36DD
38D
40C
36E
38DD
40D
38E
40DD
38F
40E
40F
% Breast excised
25
20
15
10
5
0
Volume Replacement
Therapeutic Mastopexy
Therapeutic Mammaplasty
Simple
Wide Local Excision
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
Volume of breast (cm3)
5
4
3
2
1
Tumour diameter (cm)







- **NON-PTOTIC BREAST**
  - Lateral Tumours
    - Li-CAP
    - LTAP
  - Central Tumours
    - T-DAP
    - LD miniflap
  - Medial Tumours
    - TDAP
    - LD miniflap
    - TUG flap
- **MODERATE / SMALL PTOTIC BREAST**
  - Vertical scar Therapeutic Mastopexy
- **LARGE PTOTIC BREAST**
  - Wise-pattern Therapeutic Reduction Mammaplasty
  - Simple Modified Reduction Mammaplasty

Oncoplastic surgery may improve outcomes of breast conservation

TABLE 1

Demographic characteristics.

	SBCS (n = 665)	OBCS (n = 85)	p-value
Age. Median (range), years	62.0 (28–94)	50.0 (27–75)	<0.001
Size of tumor. Median (range), cm	1.5 (0.1–5.5)	2.0 (0.4–8.0)	<0.001
Weight of breast tissue. Median (range), g	51.8 (1.8–660)	126.0 (23.5–1010)	<0.001
T and N stages			
T0, n (%)	0 (0)	0(0)	
T1, n (%)	429 (64.5)	33 (38.8)	<0.001
T2, n (%)	202 (30.3)	43 (50.6)	<0.001
T3, n (%)	35 (5.2)	7 (8.2)	0.383
N0, n (%)	400 (60.1)	49 (57.6)	0.745
N1, n (%)	126 (18.9)	20 (23.5)	<0.001
N2, n (%)	13 (2.0)	0 (0)	0.390
N3, n (%)	9 (1.4)	4 (4.7)	0.073
Smoking, n (%)	152 (22.8)	6 (7.1)	<0.05
Hormone therapy, n (%)	141 (21.2)	7 (8.2)	<0.05
Admission time. Median (range), days	1 (0.5–17)	2 (1.0–5)	<0.001
Positive family history, n (%)	104 (12.9)	11 (15.6)	0.624
DCIS, n (%)	48 (7.2)	9 (10.6)	9.375
Positive margins, n (%)	133 (20.0)	12 (14.3)	0.251
Complications, n (%)	73 (11.0)	11 (12.0)	0.720
Reoperations, n (%)	91 (13.6)	12 (14.1)	1.000
Hematoma	11 (1.7)	0 (0)	
Extended wedge	21 (3.2)	1 (1.2)	
Mastectomia	52 (7.8)	10 (11.8)	
Necrosis	5 (0.8)	0 (0)	
Node dissection	2 (0.3)	1 (1.2)	
Time between surgery and adjuvant treatment. Median (range), days	50.0 (15–202)	47.5 (22–111)	0.05

OBCS: oncoplastic breast-conservation surgery; SBCS: standard breast-conservation surgery; DCIS: ductal carcinoma in situ.

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What outcomes in particular?:

- Lower re-excision rates
- In women with large cancers (T2 and above)
  - Especially in conjunction with neo-adjuvant chemotherapy

BMJ 2012;345:e4505 doi: 10.1136/bmj.e4505 (Published 12 July 2012)

RESEARCH

Reoperation rates after breast conserving surgery for breast cancer among women in England: retrospective study of hospital episode statistics


OPEN ACCESS

R Jeevan *research fellow*[1], D A Cromwell *senior lecturer* [1 2], M Trivella *lecturer*[1 3], G Lawrence *director*[4], O Kearins *regional deputy director of breast screening quality assurance*[4], J Pereira *consultant breast surgeon* [5], C Sheppard *consultant breast care nurse* [6], C M Caddy *consultant plastic surgeon* [7], J H P van der Meulen *professor of clinical epidemiology*[1 2]

UK re-operation rates
18% for invasive disease
29.5% for DCIS

Available online at www.sciencedirect.com

SciVerse ScienceDirect

EJSO 38 (2012) 395–398

EJSO
the Journal of Cancer Surgery

www.ejso.com

How safe is oncoplastic breast conservation?: Comparative analysis with standard breast conserving surgery☆

A. Chakravorty*,[a], A.K. Shrestha, N. Sanmugalingam, F. Rapisarda, N. Roche, G. Querci della Rovere, F.A. MacNeill

Academic surgical unit, The Royal Marsden Hospital, London SW3 6JJ, UK

Tumour site and oncoplastic procedures.

	Grisotti	Benelli	Mammoplasty	Total
Site	51	22	77	150
UOQ	1	1	17	19
UIQ	2	17	8	27
Central	48	0	6	54
LOQ	0	0	27	27
LIQ	0	4	19	23

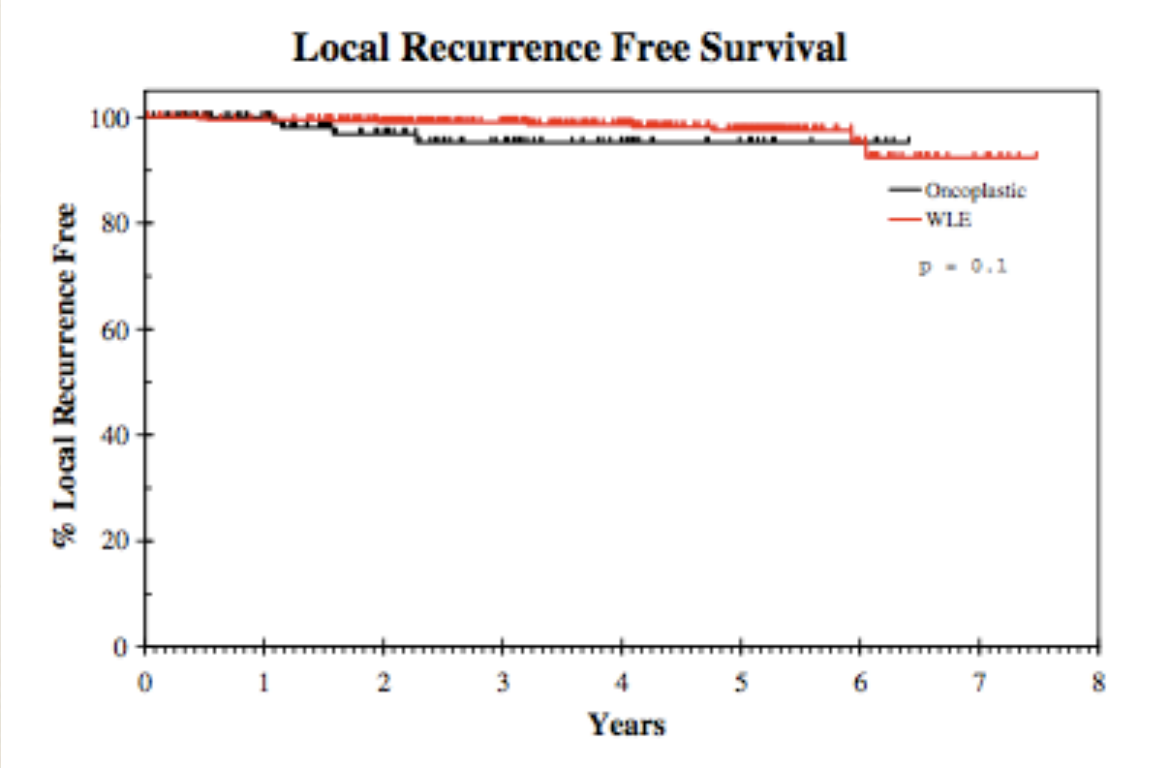
Patient demographics and tumour characteristics.

Factors	sBCS (*n* 440)	oBCS (*n* 150)	*P* value
Age: Median (range)	61 yrs (27–90 yrs)	59 yrs (26–83 yrs)	0.057
Specimen weight: Median (range)	40 g (4–335)	67 g (11–1050)	<0.001
Tumour size: Median (range)	18 mm (2–98)	21 mm (1–98)	0.001
Tumour size			
T1	259 (63%)	51 (46%)	
T2	144 (35%)	54 (48%)	0.001
T3	9 (2%)	7 (6%)	
Tumour Grade			
Grade 1	90 (22%)	9 (7%)	
Grade 2	188 (46%)	62 (58%)	0.005
Grade 3	129 (32%)	36 (34%)	
Non-invasive disease (DCIS, LCIS, Pagets, CR)	20 (5%)	36 (24%)	<0.001
Node positivity	75 (17%)	30 (20%)	0.412
Neo-adjuvant treatment	14 (3%)	38 (25%)	<0.001
Radiotherapy	407 (92%)	135 (90%)	0.332
Chemotherapy	145 (33%)	53 (35%)	0.594
Hormone therapy	349 (79%)	115 (77%)	0.491

- Re-excision rates

sBCS	14.5%
oBCS	6.6%

P <0.01



Ann Surg Oncol (2016) 23:3247–3258
DOI 10.1245/s10434-016-5313-1

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

ORIGINAL ARTICLE – BREAST ONCOLOGY

Outcomes After Oncoplastic Breast-Conserving Surgery in Breast Cancer Patients: A Systematic Literature Review

Lucy De La Cruz, MD[1,4], Stephanie A. Blankenship, MD, MPH, MS[2], Abhishek Chatterjee, MD[3], Rula Geha, MD[1], Nadia Nocera, MD[1], Brian J. Czerniecki, MD, PhD[1], Julia Tchou, MD, PhD[1], and Carla S. Fisher, MD[1]

Study (year)	No. of cases	Positive margin rate (%)	Re-excision rate (%)	Conversion to mastectomy rate (%)
Aljarrah (2012)	54	9.3	0	9.3
Caruso (2008)	63	3.2	–	0
Caruso (2011)	52	0	0	0
Chakravorty (2012)	150	–	2.7	4.0
Chang (2004)	37	5.4	0	5.4
Clough (2003)	101	10.9	0	5.9
Clough (2015)	277	11.9	4.0	9.0
Colombo (2015)	25	12.0	8.0	4.0
Crown (2015)	329	18.2	18.2	1.8
Cutress (2013)	11	0	0	0
Emiroglu (2015)	42	7.1	7.1	0
Emiroglu (2015)	82	3.7	3.7	0
Fitoussi (2010)	540	18.9	2.0	9.4
Giancalone (2007)	31	22.6	0	12.9
Grubnik (2013)	251	2.0	0.4	1.6
Hamdi (2013)	119	2.5	1.7	0.8
Hernanz (2006)	41	0	0	0
Huemer (2006)	32	6.3	0	6.3
Kaur (2005)	30	16.7	–	–
Kaviani (2014)	240	5.0	5.0	0.4
Kim (2012)	33	0	0	0
Kronowitz (2007)	41	7.3	0	7.3
Lorenzi (2016)	454	2.9	0	15.4
Losken (2007)	53	11.3	3.8	5.7
Losken (2014)	83	24.1	12.0	2.4
Malhaire (2015)	73	39.7	8.2	34.2
Mansell (2015)	119	13.4	1.7	11.8
Mazouni (2013)	45	15.6	2.2	24.4
McCulley (2005)	50	8.0	0	8.0
McCulley (2006)	11	9.1	0	9.1
Meretoja (2010)	90	12.2	0	12.2
Moustafa (2014)	21	0	0	0
Munhoz (2006)	74	9.5	8.1	1.4
Newman (2001)	28	7.1	–	3.6
Nos (1998)	50	10.0	0	4.0
Ogawa (2014)	18	5.6	5.6	0
Patel (2011)	16	12.5	0	12.5
Regano (2009)	23	0	0	0
Rezai (2015)	944	11.4	10.3	7.2
Rietjens (2007)	148	4.7	–	–
Rose (2012)	15	26.7	26.7	0
Roughton (2012)	46	6.5	0	6.5
Semprini (2013)	489	15.7	15.7	0
Sherwell-Cabello (2015)	76	2.6	2.6	0
Spear (2003)	11	0	0	0
Tenofsky (2014)	58	–	5.1	–
Vallejo da Silva (2007)	30	3.3	0	0

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	Positive margin rate (%)	Re-excision rate (%)	Conversion to mastectomy rate (%)
Weighted average	10.8	6.0	6.2

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Nottingham

	All patients	**>/=4cm No NACT**	**>/=4cm + NACT**	**>/=4cm DCIS**
Incomplete margins	10.1%	19.4%	12.5%	33%

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The solution to a high re-operation rate in breast conservation is not more mastectomies,

White JP et al, *BMJ* 2012;345:e4505

The solution to a high re-operation rate in breast conservation is not more mastectomies, ***but better conservation surgery***

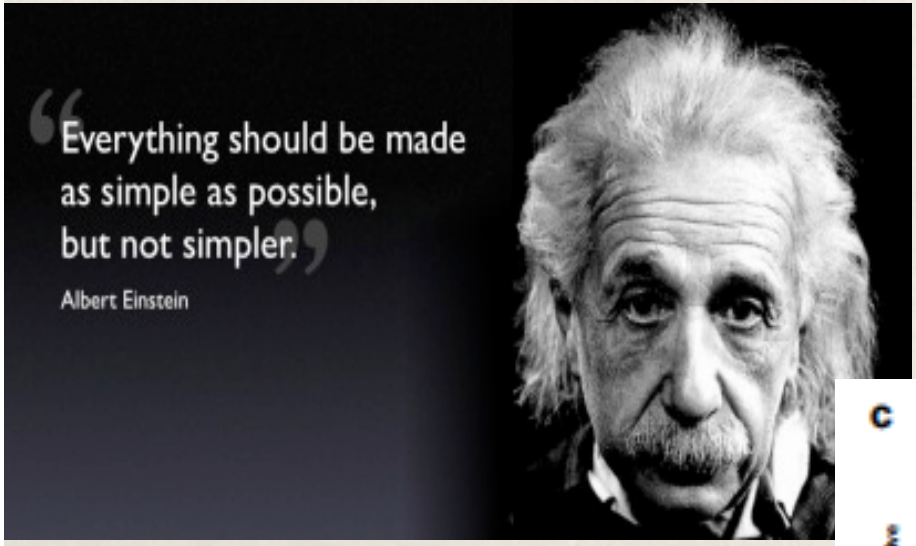
White JP et al, *BMJ* 2012;345:e4505

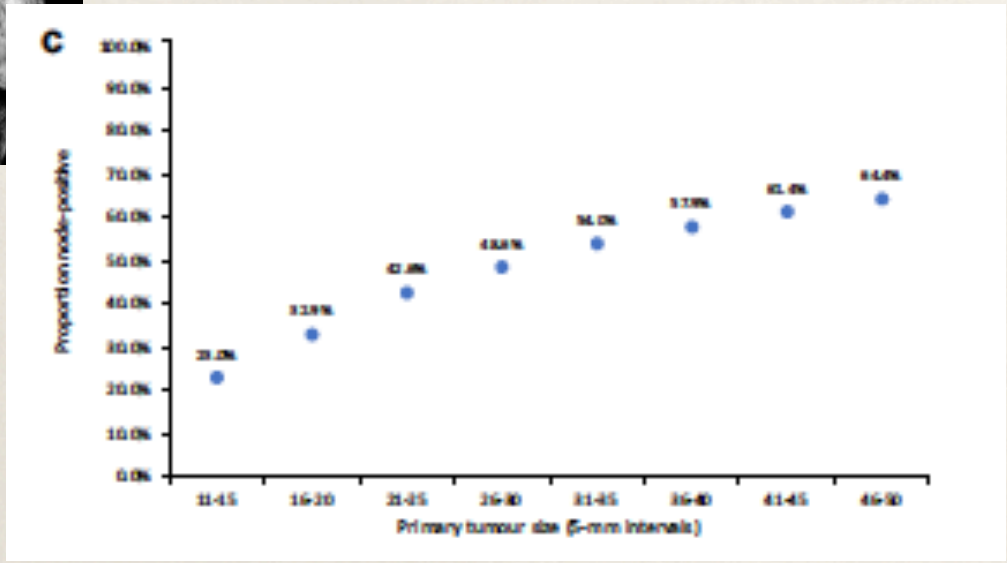
The solution to a high re-operation rate in breast conservation is not more mastectomies, ***but more oncoplastic breast conservation surgery***

What outcomes in particular?:

- Lower re-excision rates
- In women with large cancers (T2 and above)
  - Especially in conjunction with neo-adjuvant chemotherapy

Tumour size





Breast Cancer Research and Treatment
https://doi.org/10.1007/s10549-018-4796-9

EPIDEMIOLOGY

The relationship between tumour size, nodal status and distant metastases: on the origins of breast cancer

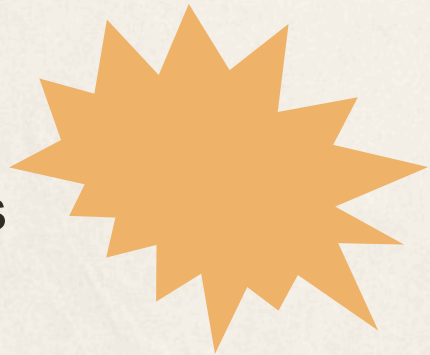
Victoria Sopik[1,2] · Steven A. Narod[1,3]

TUMOUR SIZE AND MULTIFOCALITY

Holland et al

< 2 cm tumours

Up to 4 cm tumours



2 cm margins

2 cm margins

4 cm margins

4 cm margins

TUMOUR SIZE AND MULTIFOCALITY

Holland et al

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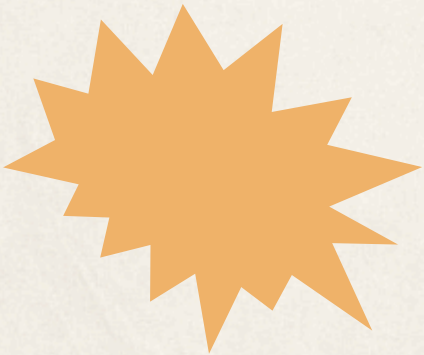
Up to 4 cm tumours



2 cm margins 42%

2 cm margins 41%

4 cm margins 10%

4 cm margins 11%

Tumour size and multifocality

Tumour size	% with multifocality
<3cm	33%
>3cm	80%

Vaidya et al, British Journal of Cancer 74(1996),820-824

Tumour Size

PERGAMON

European Journal of Cancer 39 (2003) 2462–2469

European Journal of Cancer

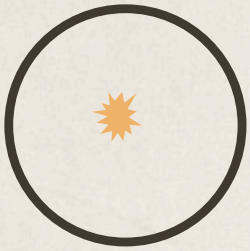
www.ejconline.com

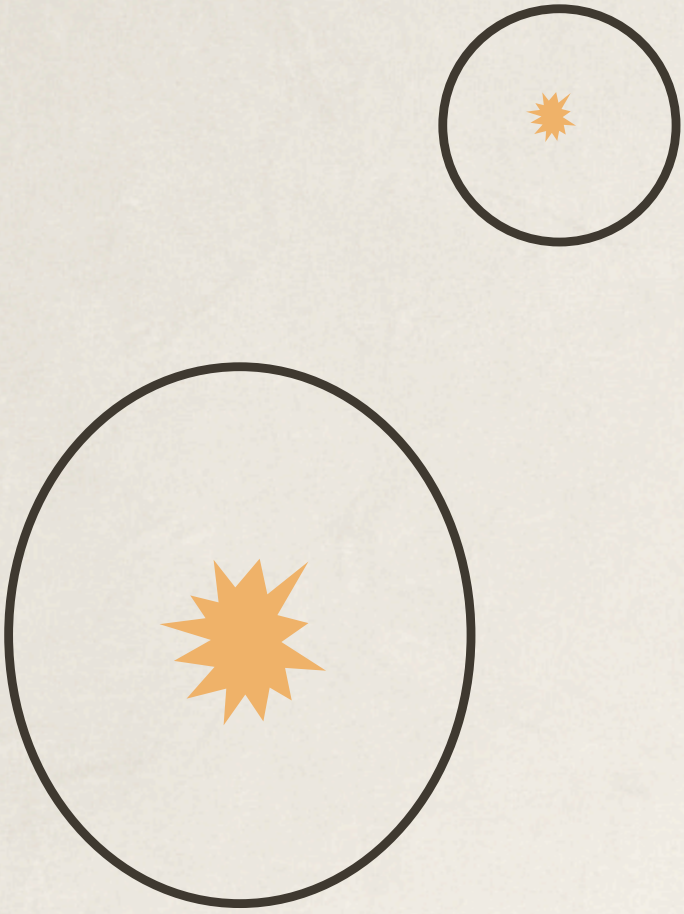
Review

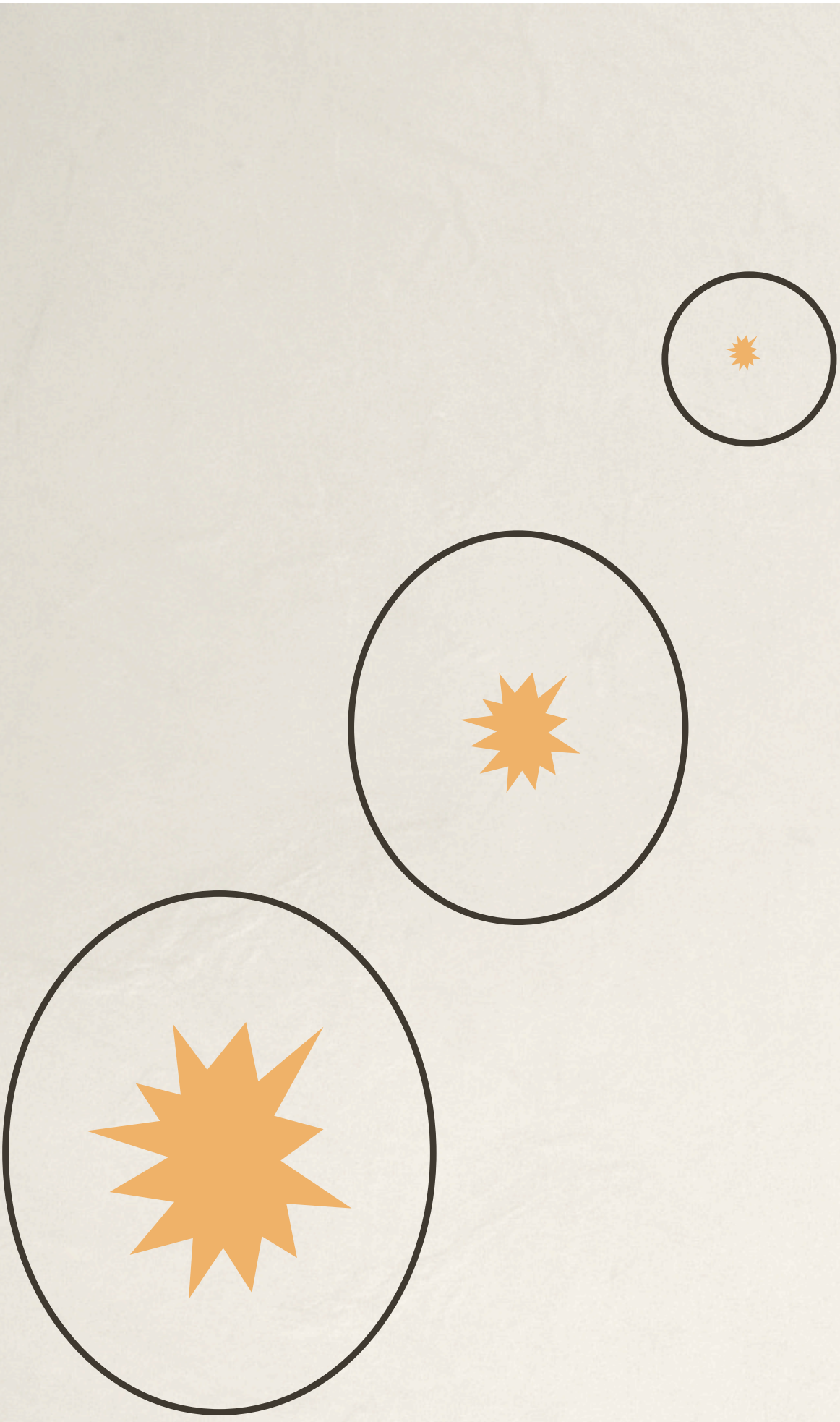
Size of invasive breast cancer and risk of local recurrence after breast-conservation therapy

K.S. Asgeirsson, S.J. McCulley, S.E. Pinder, R.D. Macmillan*

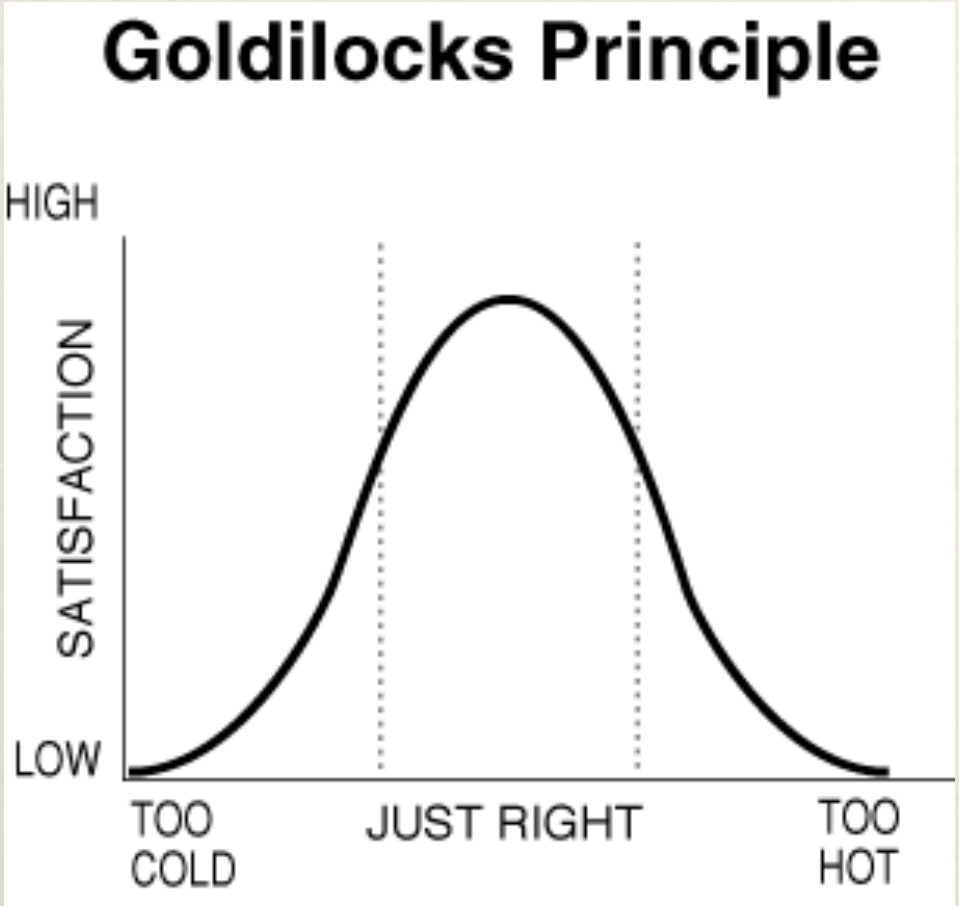
The Nottingham Breast Unit, Nottingham City Hospital, Hucknall Road, Nottingham NG5 1PB, UK

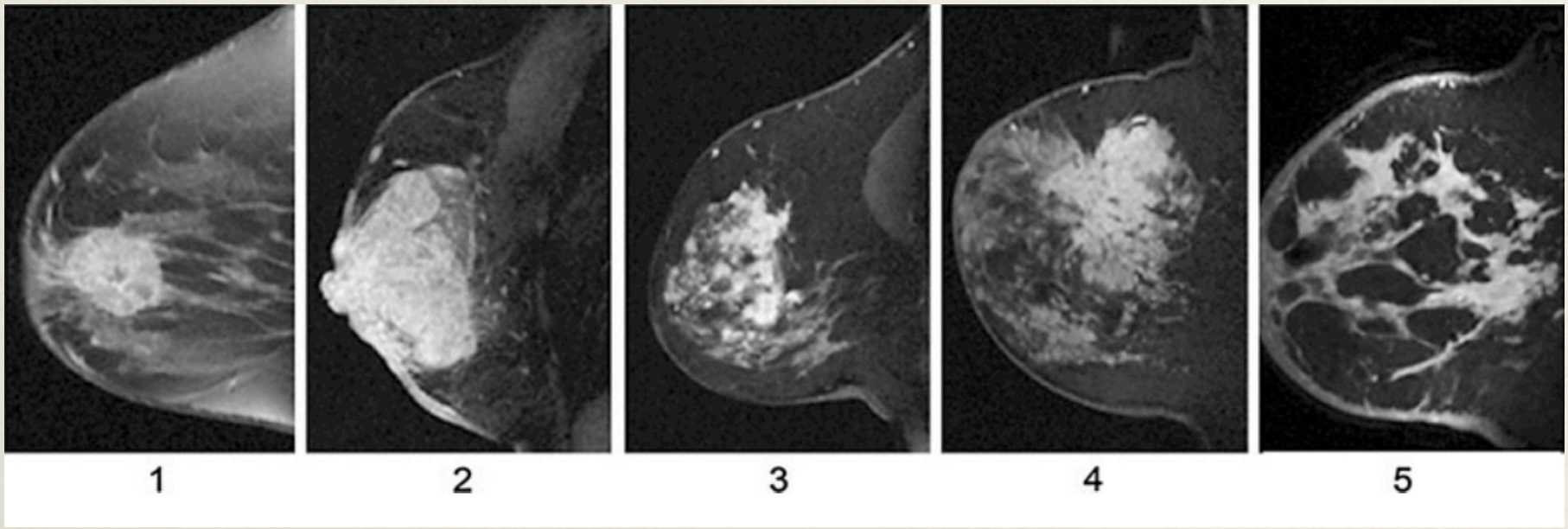






How much breast tissue do you need to take after neo-adjuvant chemotherapy?




1
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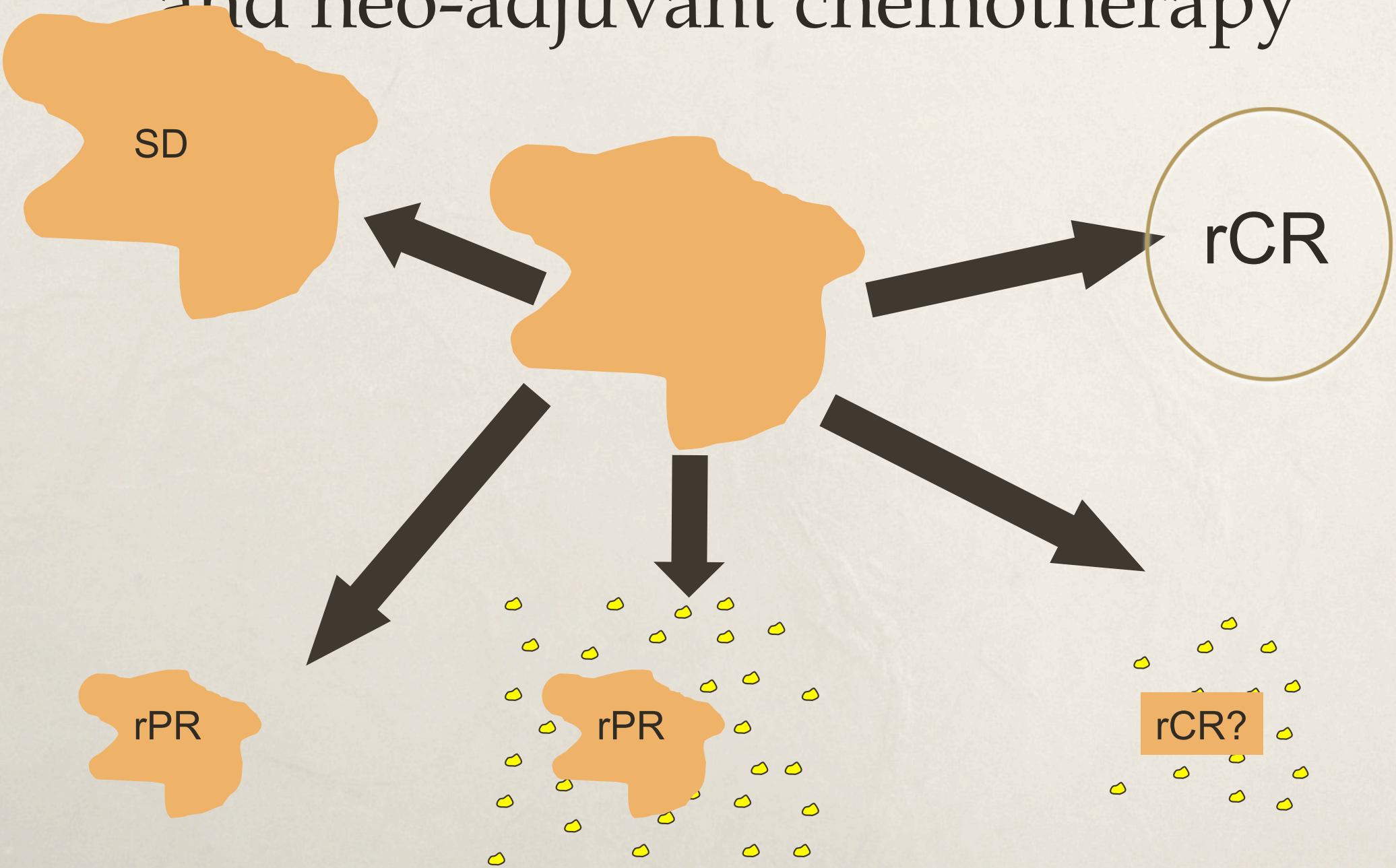
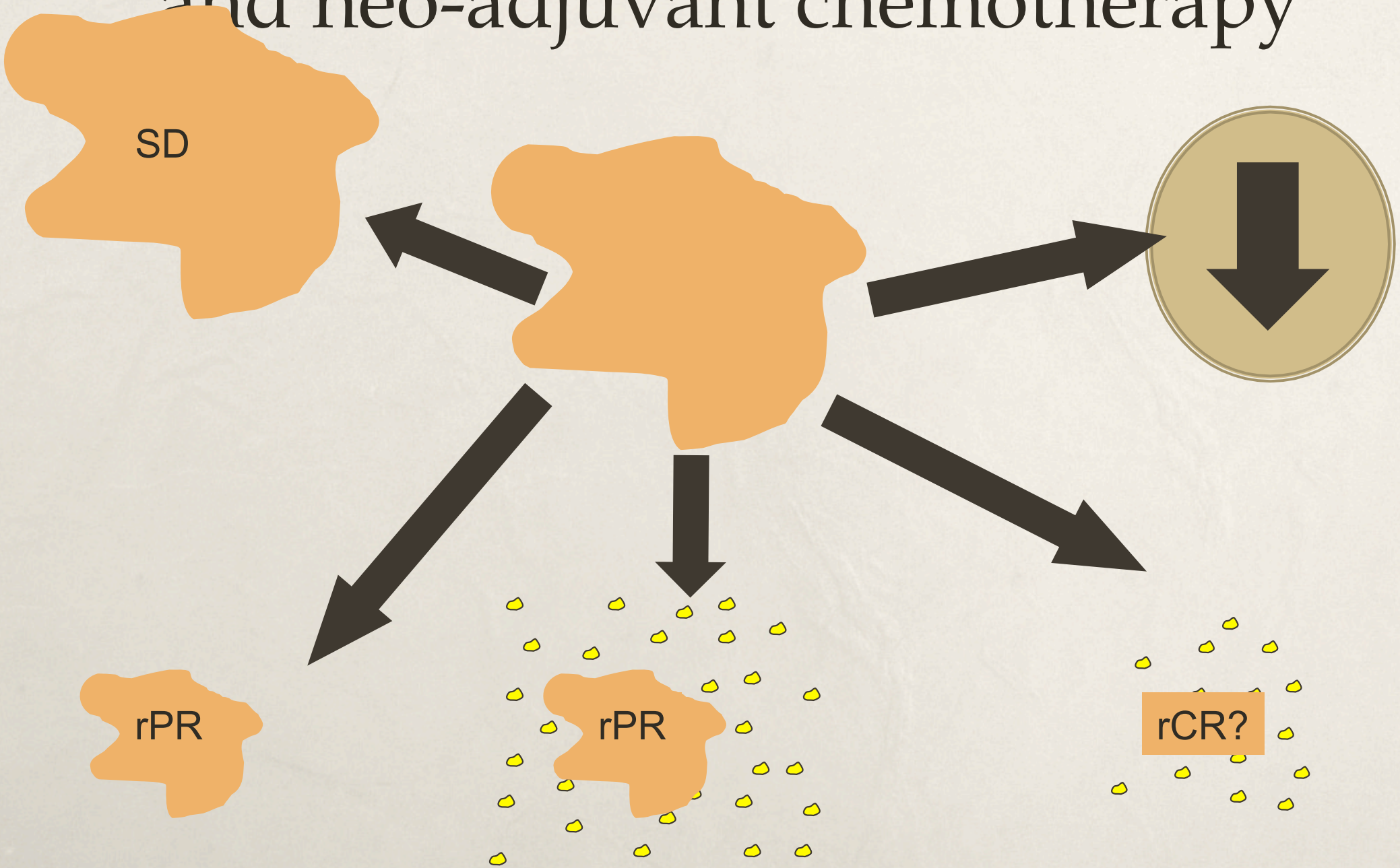
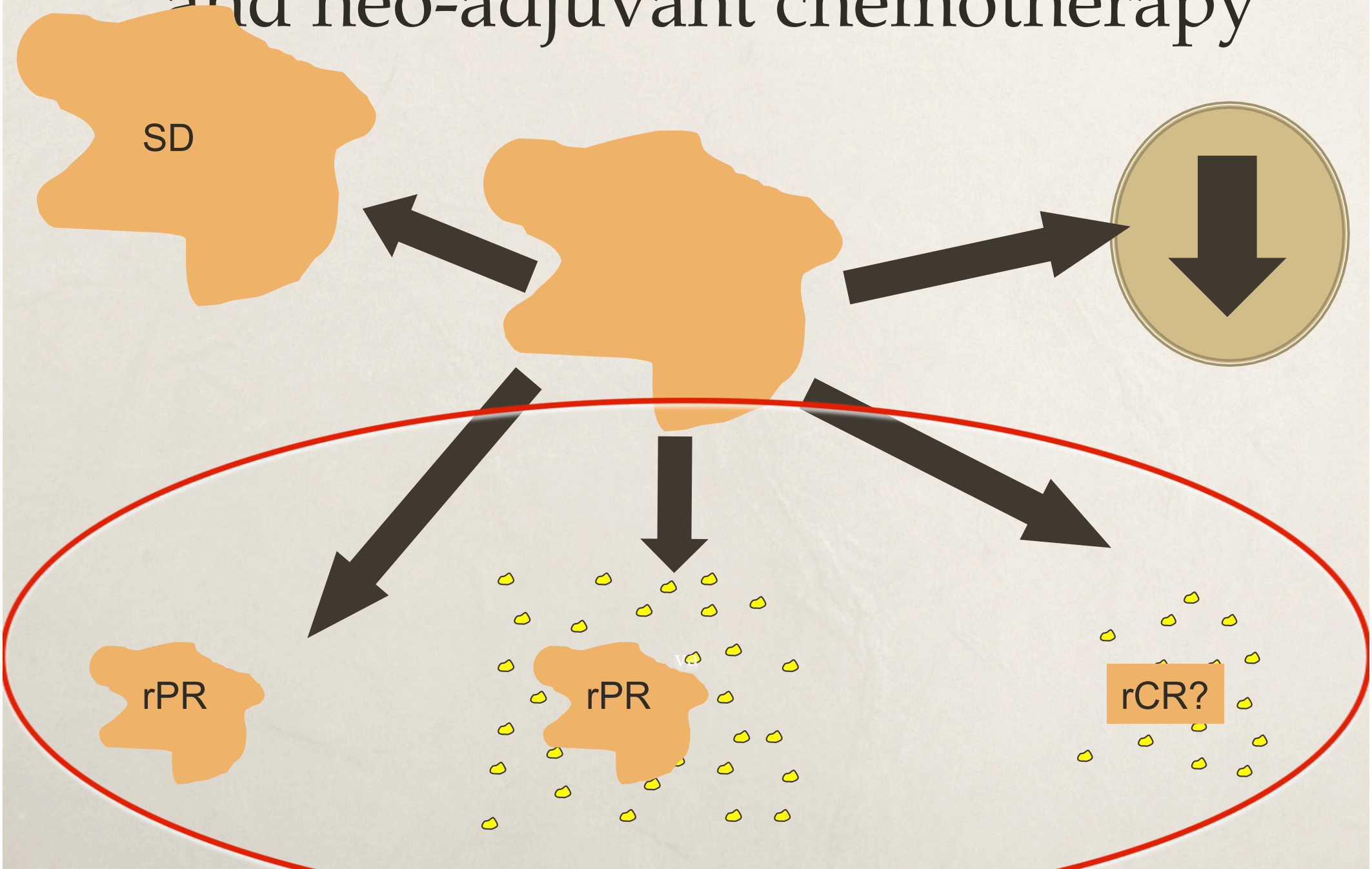
Oncoplastic breast conservation and neo-adjuvant chemotherapy



Oncoplastic breast conservation and neo-adjuvant chemotherapy



Oncoplastic breast conservation and neo-adjuvant chemotherapy

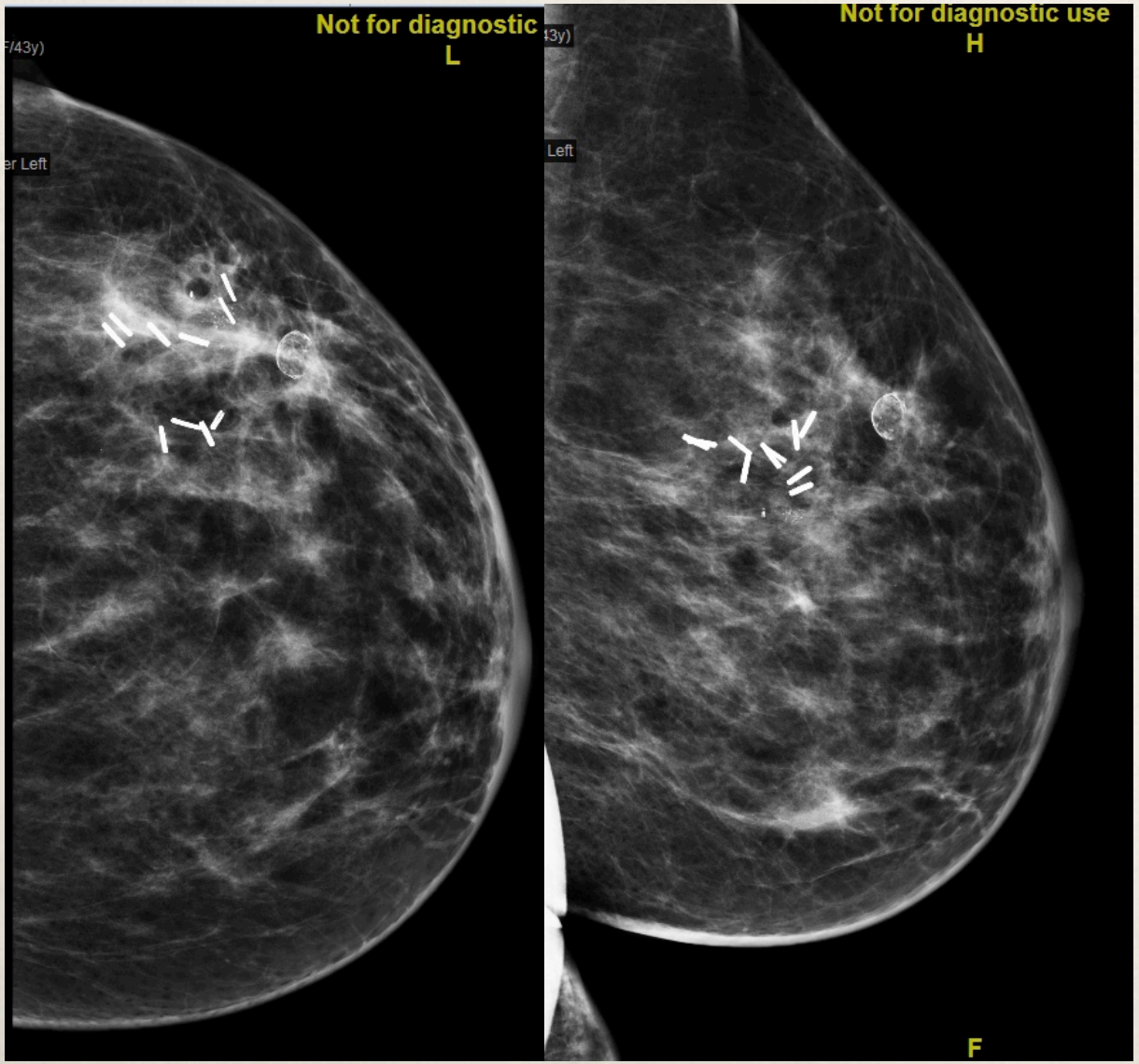


Indications for NACT

- Offer all HER-2 +ve >2cm
  - Pertuzumab
    - pCR increased by 17-21% (57-66%)
- Discuss with all triple negative patients <60
  - Genetic testing
  - Exceptions
    - Affected mutation carriers
- Discuss with all =/> 3cm (Irrespective of ER or HER-2 status)

Oncoplastic breast conservation give fantastic access

How do these techniques affect planning boost?



Summary:

- For cancers <3cm in size, giving choice is no longer appropriate

- All modern breast surgery, especially breast conservation, is oncoplastic and training needs to reflect that reality

Summary

- Oncoplastic breast surgery improves outcomes of breast conservation
  - Decreases re-operation rates
- NACT and oncoplastic breast conservation fit well together……like rotten shark and brennivín