Renal cell carcinoma and stereotactic body radiotherapy: a perfect circle.

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1

2

3

The 11th commandment …

4

The 11th commandment …

Thy shall not use radiotherapy to treat RCC! It does not work!

5

Stereotactic ablative body radiotherapy for primary kidney cancer (TROG 15.03 FASTRACK II): a non-randomised phase 2 trial

*Shankar Siva, Mathias Bressel, Mark Sidhom, Swetha Sridharan, Ben G L Vanneste, Ryan Davey, Rebecca Montgomery, Jeremy Ruben, Farshad Foroudi, Braden Higgs, Charles Lin, Avi Raman, Nicholas Hardcastle, Michael S Hofman, Richard De Abreu Lourenco, Mark Shaw, Pascal Mancuso, Daniel Moon, Lih-Ming Wong, Nathan Lawrentschuk, Simon Wood, Nicholas R Brook, Tomas Kron, Jarad Martin, David Pryor, together with the FASTRACK II Investigator Group**

Tumors </= 4 cm: 1 fraction of 26 Gy

Tumors > 4 cm: 3 fractions of 14 Gy

Median FU: 44 months

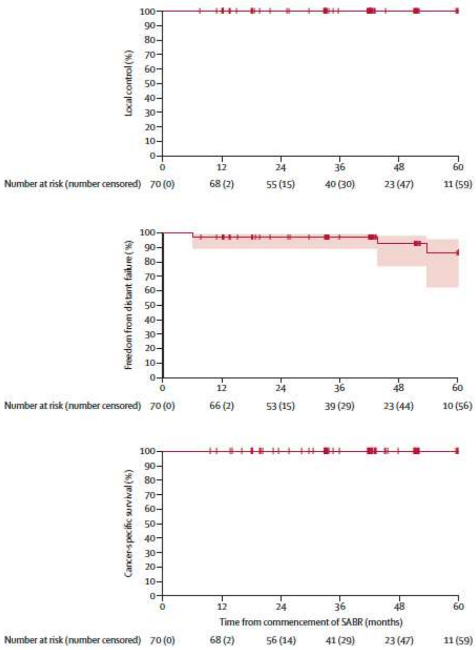
	Assessment			
	CT (thorax, abdomen)	eGFR (CKD-EPI equation)	Split renal function test and calculated GFR (nuclear medicine)	Whole-body bone scan
Baseline	✓	✓	✓	✓
Year 1	3 monthly	3 monthly	Annually	..
Year 2	6 monthly	6 monthly	Annually	..
Up to year 5	9 monthly	9 monthly	42 months, 60 months	..
After 5 years	Annually	Annually	Annually	..
At progression	✓	✓	..	✓

6

Local control

dMFS

CSS



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De Meerleer et al, Lancet Oncol, 2014

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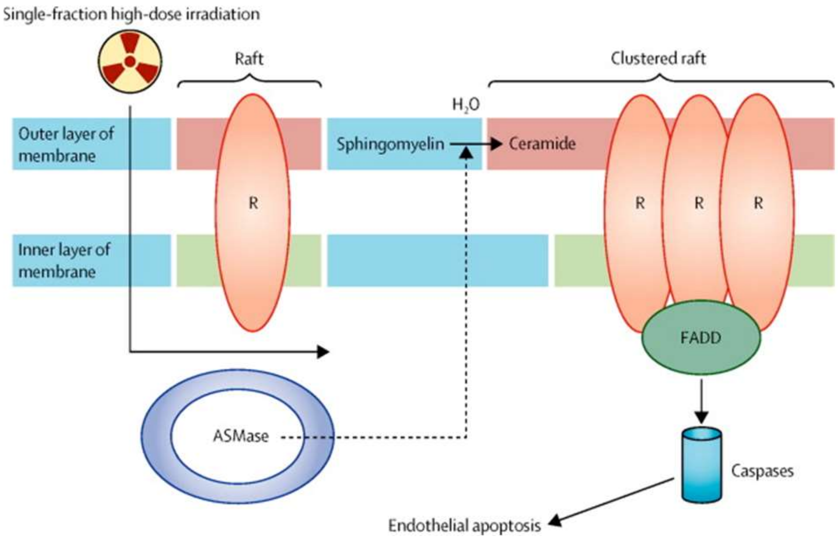

De Meerleer et al, Lancet Oncol, 2014

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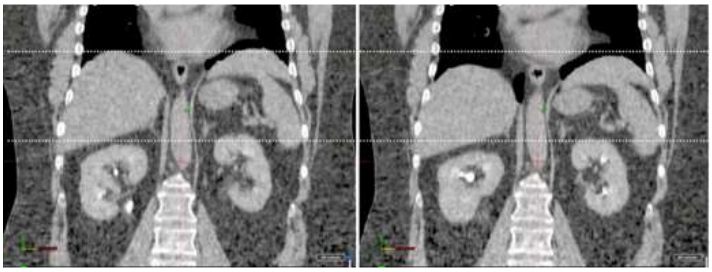
supine position

if possible: IV contract

arms above head

10



supine position

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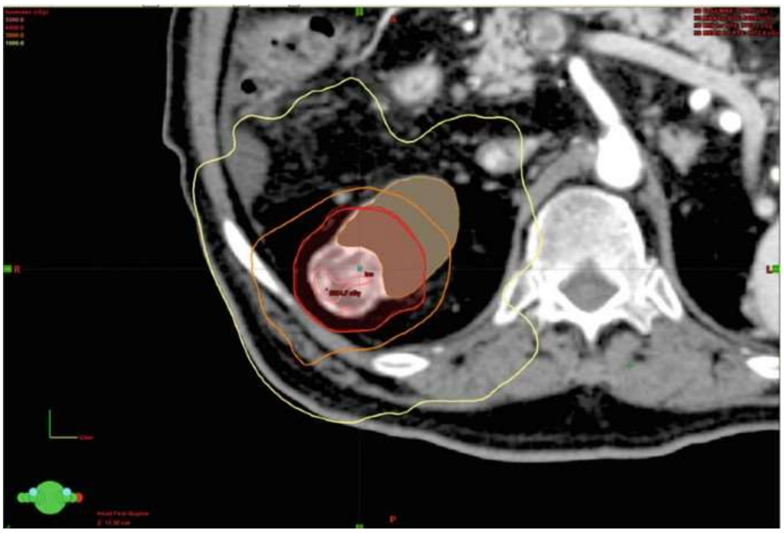
arms above head

4D CT

11



supine position

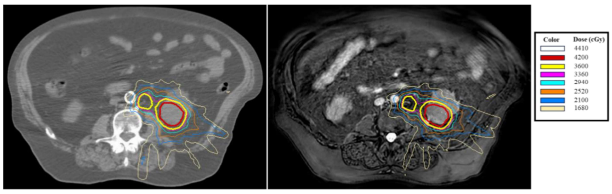
if possible: IV contract

arms above head

4D CT

IGRT

12



supine position

if possible: IV contract

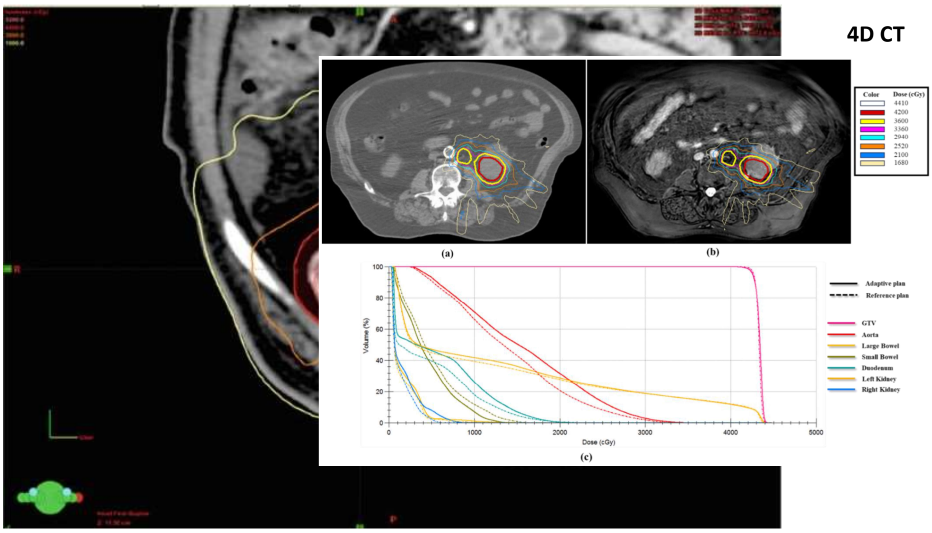
arms above head

4D CT

IGRT

optional: MR-linac

13



4D CT

osition

le: IV contract

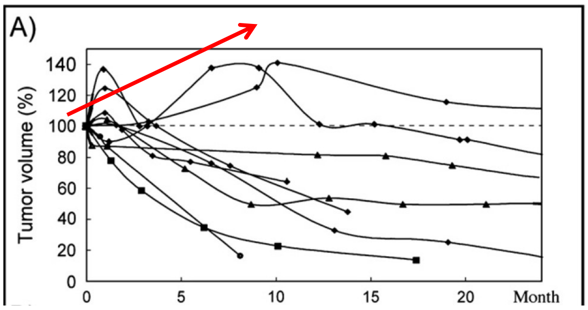
ove head

: MR-linac

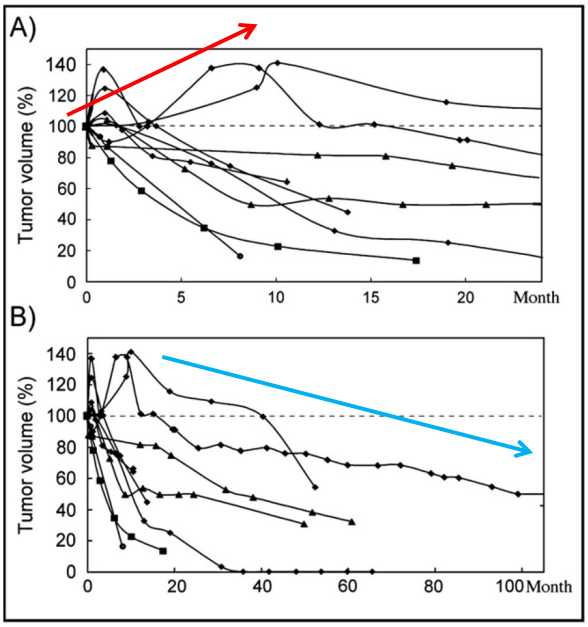
14


SPECIALS
2
TONE

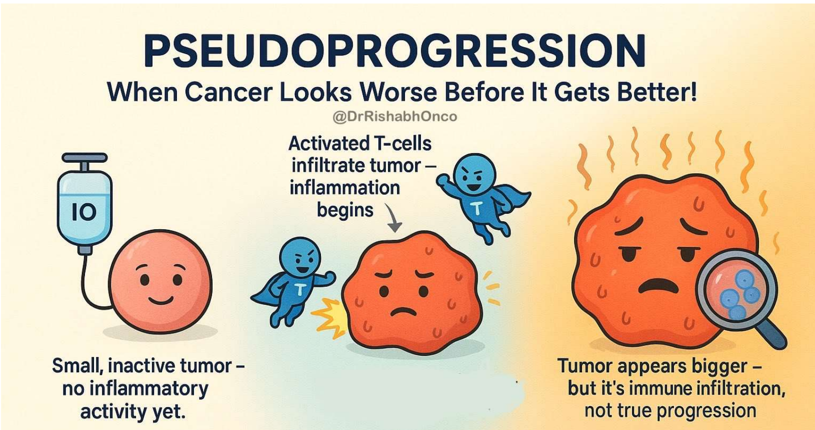
15

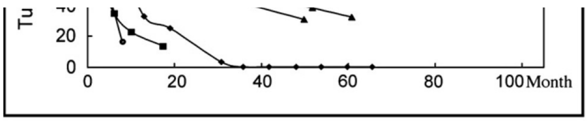

A)
Tumor volume (%)
140
120
100
80
60
40
20
0
0
5
10
15
20
Month

16

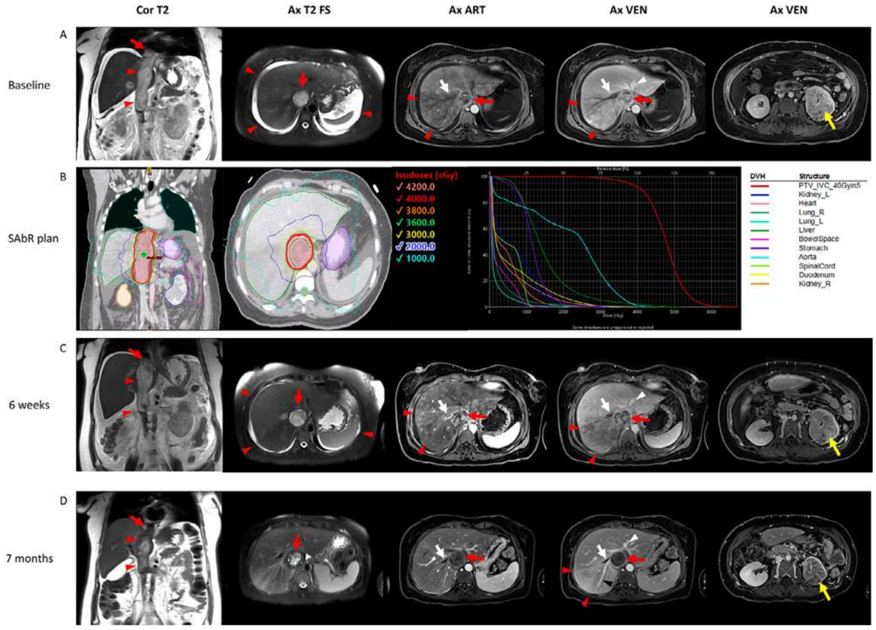

A)
Tumor volume (%)
140
120
100
80
60
40
20
0
0
5
10
15
20
Month
B)
Tumor volume (%)
140
120
100
80
60
40
20
0
0
20
40
60
80
100
Month

17


PSEUDOPROGRESSION
When Cancer Looks Worse Before It Gets Better!
@DrRishabhOnco
Activated T-cells infiltrate tumor – inflammation begins
IO
T
T
Small, inactive tumor – no inflammatory activity yet.
Tumor appears bigger – but it's immune infiltration, not true progression


20
0
0
20
40
60
80
100
Month

18

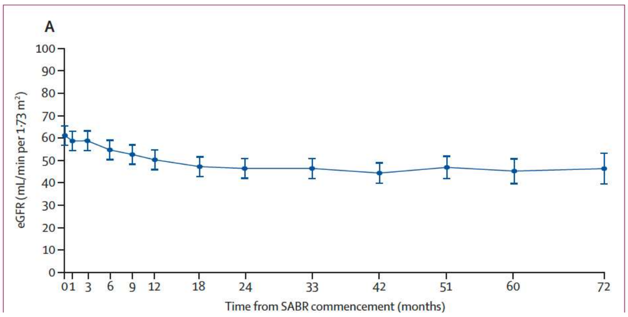


Cor T2
Ax T2 FS
Ax ART
Ax VEN
Ax VEN
A
Baseline
B
SAbR plan
Isodoses [cGy]
✓ 4200.0
✓ 4000.0
✓ 3800.0
✓ 3600.0
✓ 3000.0
✓ 2000.0
✓ 1000.0
DVH
Structure
PTV_IVC_40Gyin5
Kidney_L
Heart
Lung_R
Lung_L
Liver
BowelSpace
Stomach
Aorta
SpinalCord
Duodenum
Kidney_R
C
6 weeks
D
7 months

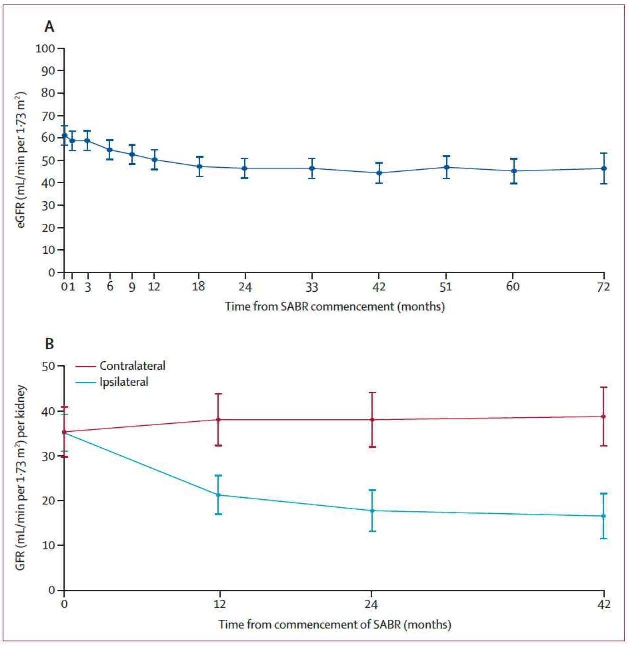
19

BRITNEY SPEARS
TOXIC

20


A
eGFR (mL/min per 1·73 m²)
100
90
80
70
60
50
40
30
20
10
0
0 1 3 6 9 12 18 24 33 42 51 60 72
Time from SABR commencement (months)

21


A
eGFR (mL/min per 1·73 m²)
100
90
80
70
60
50
40
30
20
10
0
0 1 3 6 9 12 18 24 33 42 51 60 72
Time from SABR commencement (months)
B
Contralateral
Ipsilateral
GFR (mL/min per 1·73 m²) per kidney
50
40
30
20
10
0
0 12 24 42
Time from commencement of SABR (months)

22

	Grade 1	Grade 2	Grade 3
Any adverse event*	34 (49%)	18 (26%)	7 (10%)
Vomiting	1 (1%)	0	2 (3%)
Abdominal pain	0	0	2 (3%)
Colonic obstruction	0	0	2 (3%)
Flank pain	22 (31%)	9 (13%	1 (1%)
Nausea	18	2 (3%)	1 (1%)
Diarrhoea	5	1 (1%)	1 (1%)
Tumour pain	0	0	1 (1%)
Elevated creatinine	0	2 (3%)	0
Fatigue	32 (46%)	11 (16%	0
Gastritis	6	1 (1%)	0
Colitis	0	1 (1%)	0
Thromboembolic event	0	1 (1%)	0
Dermatitis	5 (7%)	0	0
Haematuria	5 (7%)	0	0
Chest wall pain	2 (3%)	0	0
Duodenal ulcer	1 (1%)	0	0
Elevated C-reactive protein	1 (1%)	0	0
Fracture	1 (1%)	0	0

Data are n (%). Adverse events were graded according to Common Terminology Criteria for Adverse Events (version 4.03). No grade 4 treatment-related adverse events or deaths occurred. *Number of patients whose worst adverse event was grade 1, 2, or 3.

Table 2: **Adverse events related to treatment in 70 participants**

23

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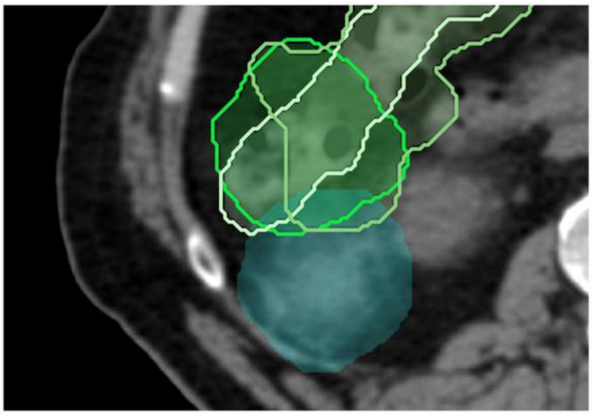

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	SBRT (N=612)	Radiofrequency ablation (N=2503)	Microwave ablation (N=2069)	Cryoablation (N=3726)

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	SBRT (N=612)	Radiofrequency ablation (N=2503)	Microwave ablation (N=2069)	Cryoablation (N=3726)
Local control (primary endpoint)				
Overall				
1 year	99% (97–100; I^2=6%)	96% (94–98; I^2=73%)	97% (95–99; I^2=74%)	95% (93–96; I^2=61%)
2 years	97% (95–99; I^2=0%)	95% (92–98; I^2=77%)	95% (92–98; I^2=77%)	94% (91–96; I^2=69%)
5 years	95% (89–98; I^2=42%)	92% (88–96; I^2=78%)	86% (75–94; I^2=66%)	90% (87–93; I^2=74%)
Tumour size <4 cm				
1 year	98% (93–100; I^2=0%)	97% (94–98; I^2=74%)	97% (95–99; I^2=77%)	96% (95–97; I^2=48%)
2 years	95% (90–99; I^2=0%)	96% (93–98; I^2=77%)	96% (93–98; I^2=79%)	95% (93–97; I^2=62%)
5 years	98% (91–100; I^2=0%)	95% (91–97; I^2=65%)	92% (72–100; I^2=61%)	91% (88–94; I^2=75%)
Tumour size ≥4 cm				
1 year	99% (97–100; I^2=26%)	91% (86–95; I^2=0%)	94% (91–97; I^2=0%)	88% (82–94; I^2=59%)
2 years	98% (96–99; I^2=0%)	88% (83–93; I^2=0%)	92% (87–96; I^2=15%)	86% (80–92; I^2=52%)
5 years	93% (85–98; I^2=59%)	79% (64–91; I^2=83%)	82% (65–94; I^2=78%)	85% (76–93; I^2=60%)

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PSMA-Guided Metastasis-Directed Therapy for Oligometastatic Renal Cell Carcinoma: The Proof-of-Concept PEDESTAL Study

J Nucl Med 2025; 66:531–536
DOI: 10.2967/jnumed.124.268639

"Definitive local control of metastases is one option that could delay or even eliminate the need for systemic therapy."

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PSMA-Guided Metastasis-Directed Therapy for Oligometastatic Renal Cell Carcinoma: The Proof-of-Concept PEDESTAL Study

J Nucl Med 2025; 66:531–536
DOI: 10.2967/jnumed.124.268639

Number of MDT sites	
1	19 (56%)
2	9 (26%)
3	3 (9%)
4	1 (3%)
5	2 (6%)
Characteristic (per metastasis; total n = 60)	
Location	
Bone	19 (32%)
Lung	19 (32%)
Nodal	13 (22%)
Viscera	9 (15%)

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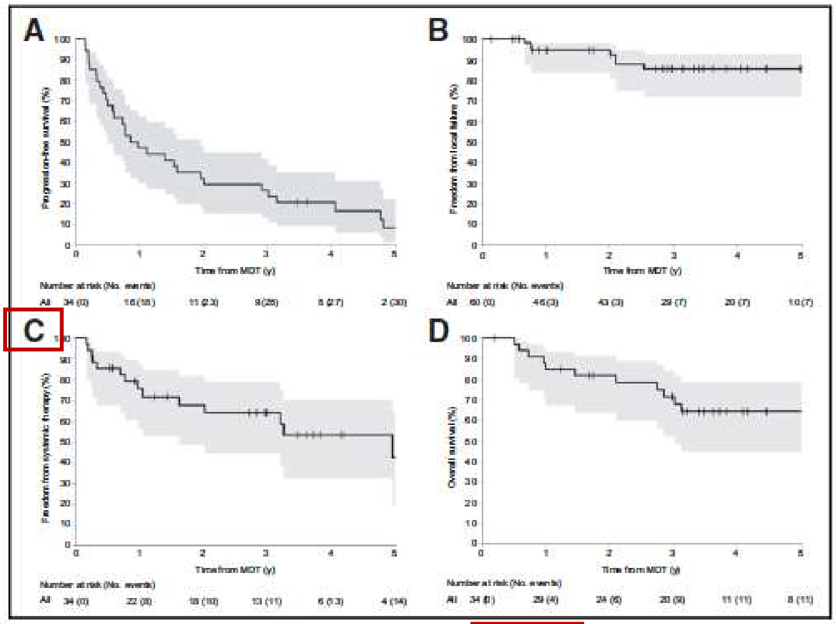

FIGURE 2. Time-to-event outcomes: PFS (A), FFLP (B), FFCSTS (C), and OS (D).

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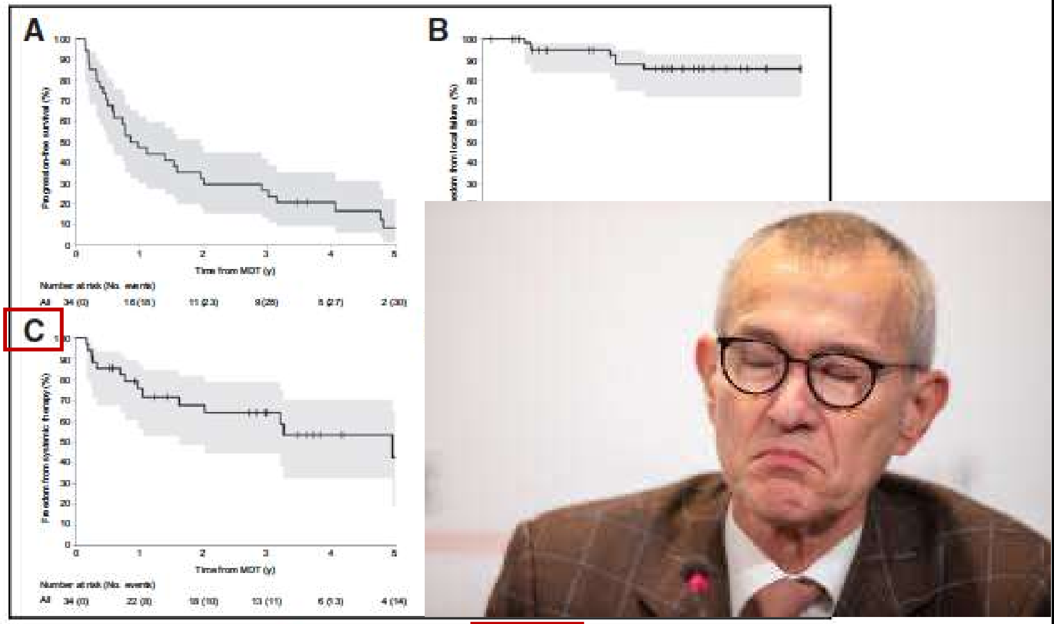
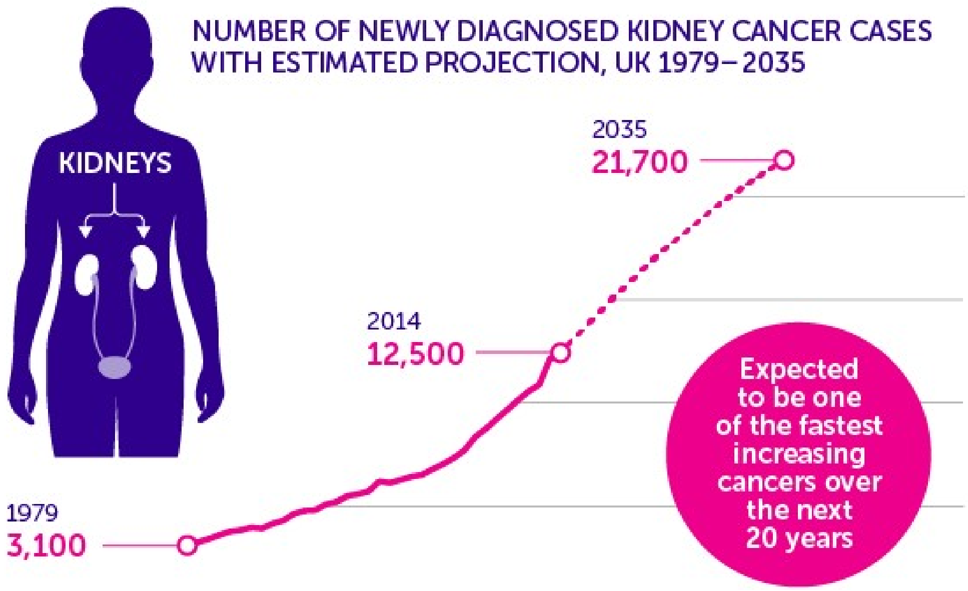


FIGURE 2. Time-to-event outcomes: PFS (A), FFLP (B), FFCSTS (C), and OS (D).

30


NUMBER OF NEWLY DIAGNOSED KIDNEY CANCER CASES
WITH ESTIMATED PROJECTION, UK 1979–2035
KIDNEYS
2035
21,700
2014
12,500
1979
3,100
Expected to be one of the fastest increasing cancers over the next 20 years

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novastar
THE BEST IS YET TO COME
OFFICIAL AUDIO

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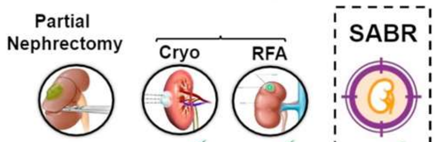
Primary RCC: Nephron Sparing Options



	Partial Nephrectomy	Thermal Ablation: Cryo	Thermal Ablation: RFA	SABR
Avoids general anaesthetic?	✗	✓	✓	✓
Peri-hilar tumors?	✓	✗	✗	✓
Large tumors?	✓	✗	✗	✓
Non-invasive?	✗	✗	✗	✓

Excellent local control

Very low toxicity rates

IGRT and 4DCT available: ready to go !

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Thy shall use stereotactic body radiotherapy to treat RCC!
It works!

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