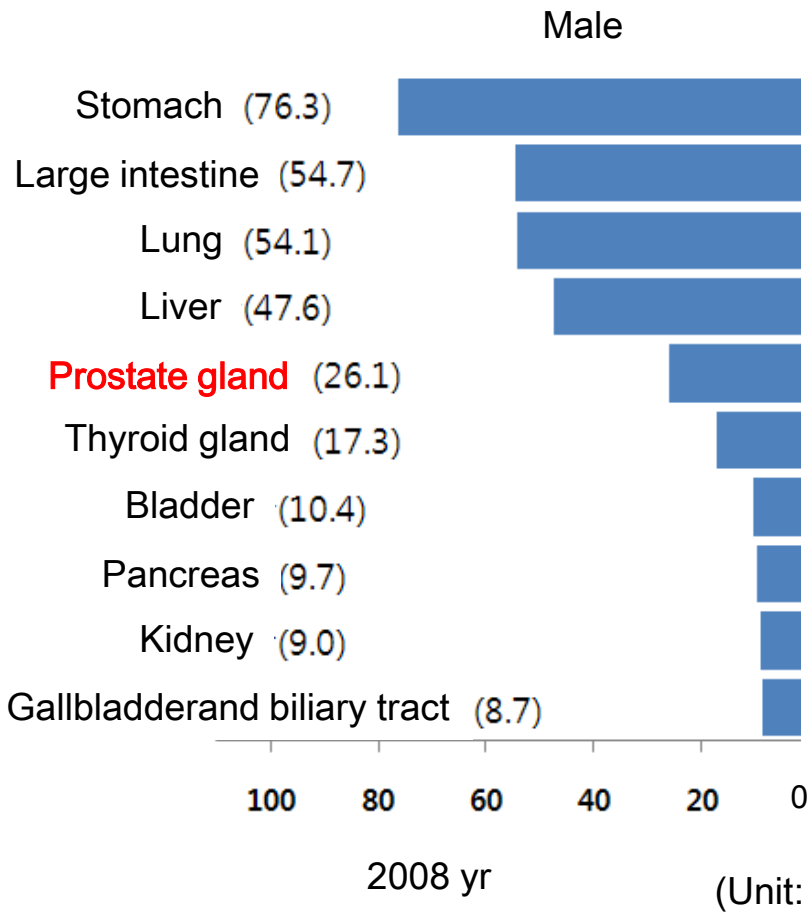
Iodine-125 Permanent Implant for Localized Prostate Cancer

Seunghee Kim, Youjin Jung, Seon-Heui Lee

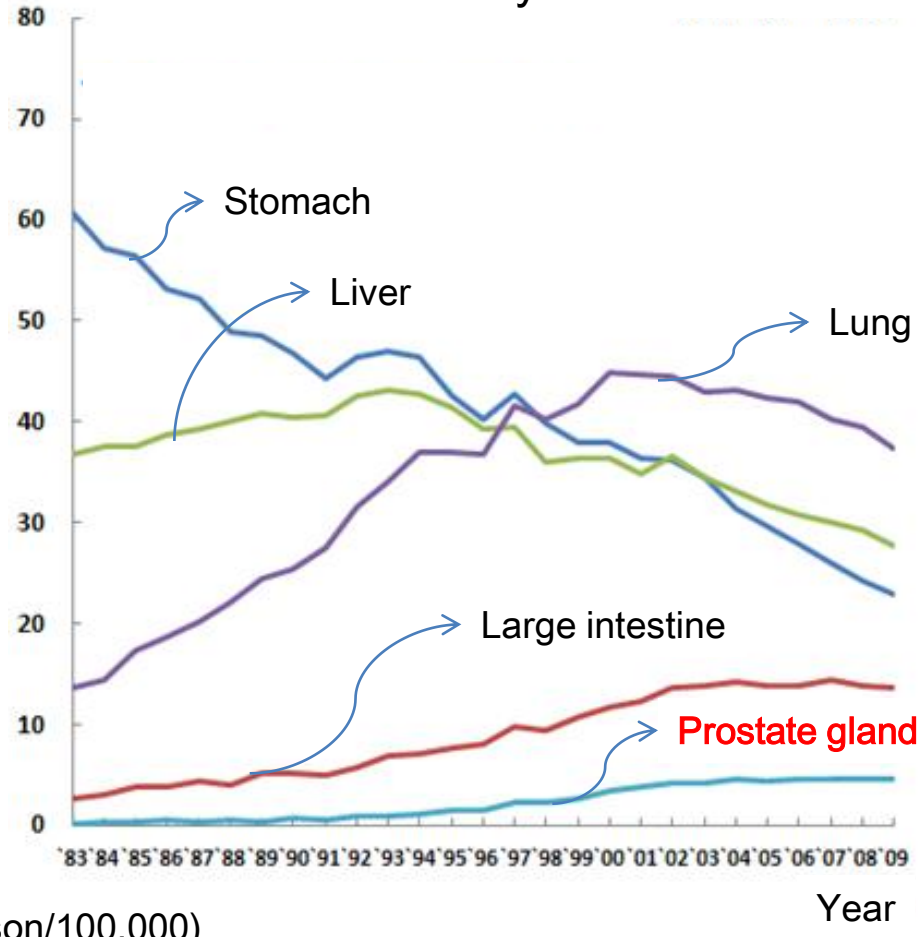
National Evidence-Based Healthcare Collaborating Agency - NECA

BACKGROUND

Crude Incidence Rate



Mortality Rate

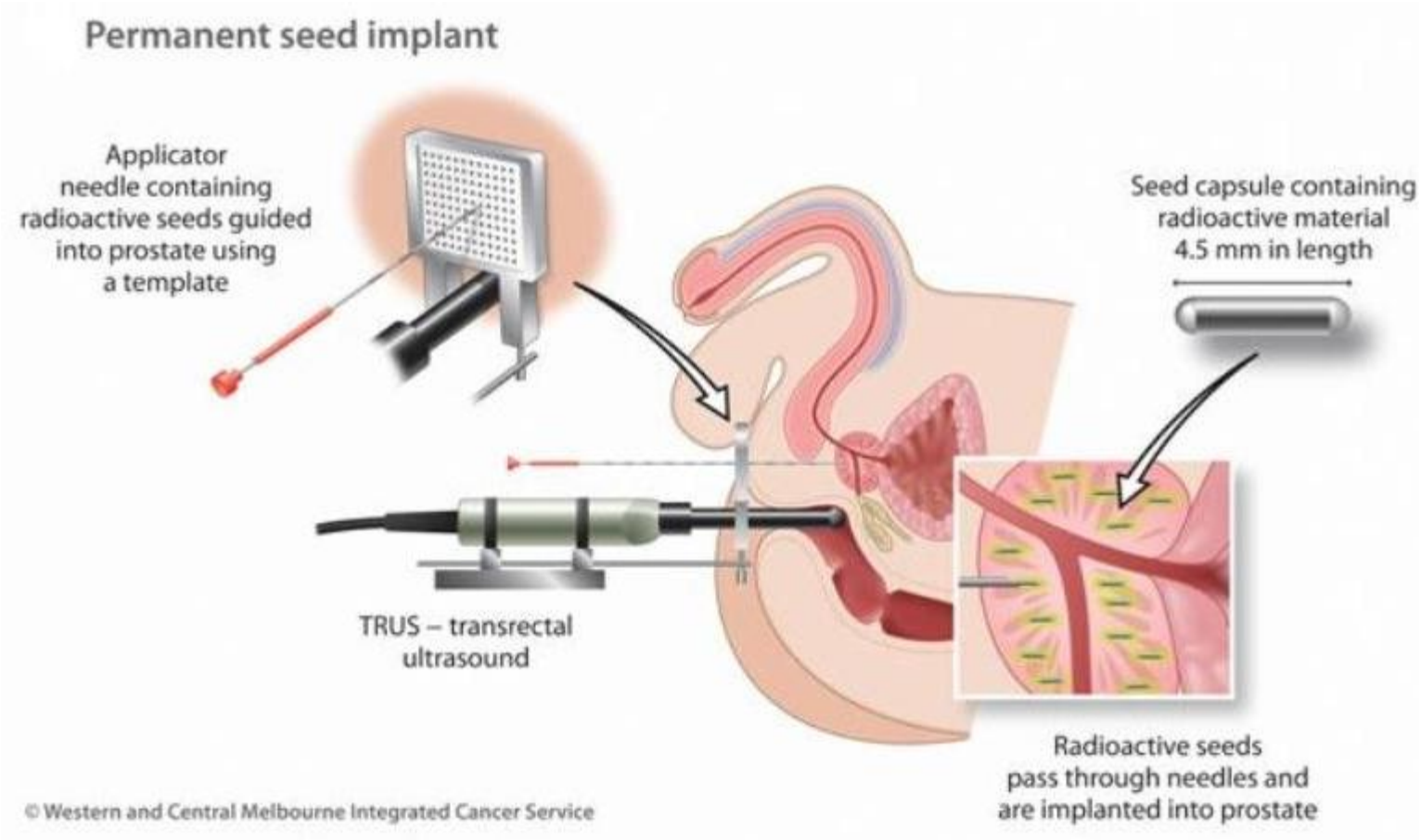


(Unit: person/100,000)

BACKGROUND

Brachytherapy

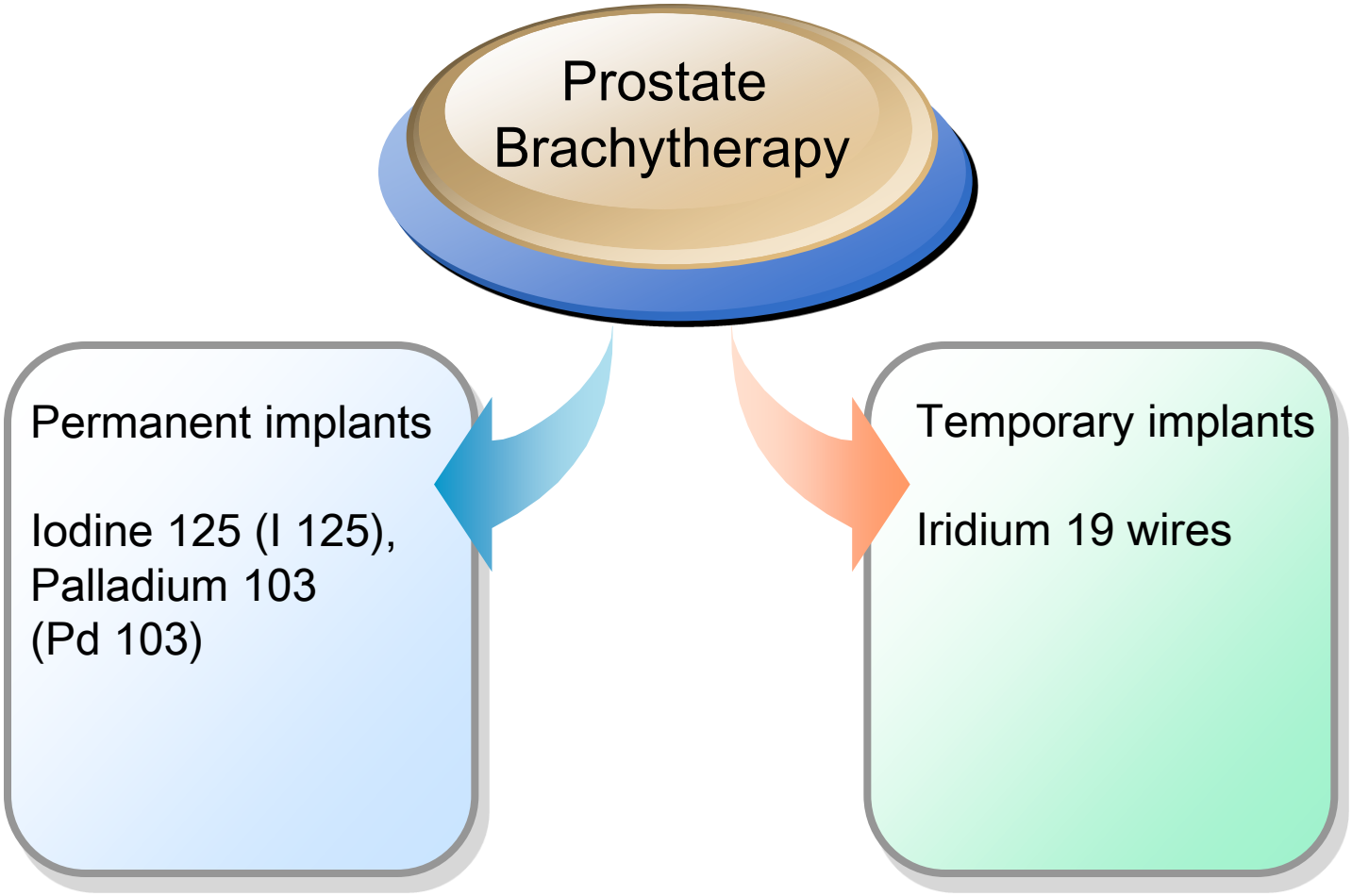
- The implantation of radioactive sources into prostate gland



BACKGROUND

Advantages	Localized effect Limiting the side-effects to adjacent tissues
Disadvantage	High radiation dose

BACKGROUND


Prostate Brachytherapy
Permanent implants
Iodine 125 (I 125), Palladium 103 (Pd 103)
Temporary implants
Iridium 19 wires

OBJECTIVE

To evaluate the safety and effectiveness of Iodine-125 permanent implant for treating localized prostate cancer compared with radical prostatectomy(RP) and external beam radiation therapy(EBRT).

METHODS

1. Search strategy

Korea DB	Koreamed	http://www.koreamed.org
	The national library of Korea	http://www.nl.go.kr
	National Assembly Library	http://www.nanet.go.kr
	KOLIS-net	http://www.nl.go.kr/kolisnet
	KERIS	http://www.riss4u.net
	Koreanstudies Information service system	http://kiss.kstudy.com.
	Kisti	http://society.kisti.re.kr
	Kmbase	http://kmbase.medric.or.kr
DB	Ovid-MEDLINE	
	EMBASE	http://www.embase.com
	Cochrane library	
HTA Organization	39 Organizations	

Adelaide Health Technology Assessment

AHTA

THE UNIVERSITY of ADELAIDE

U.S. Department of Health & Human Services

www.hhs.gov

AHRQ Agency for Healthcare Research and Quality

Advancing Excellence in Health Care

Search AHRQ Go

www.ahrq.gov

Agence d'évaluation des technologies et des modes d'intervention en santé

Québec

Home Site map Email Québec Portal Français

Home | My page

Login

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS

College of Surgeons of Australia and New Zealand

KCE

Belgian Health Care Knowledge Centre

Generalitat de Catalunya
www.gencat.cat

Site map Contact Català Castellà cercar

Catalan Agency for Health Information, Assessment and Quality

A A A

Canadian Agency for Drugs and Technologies in Health

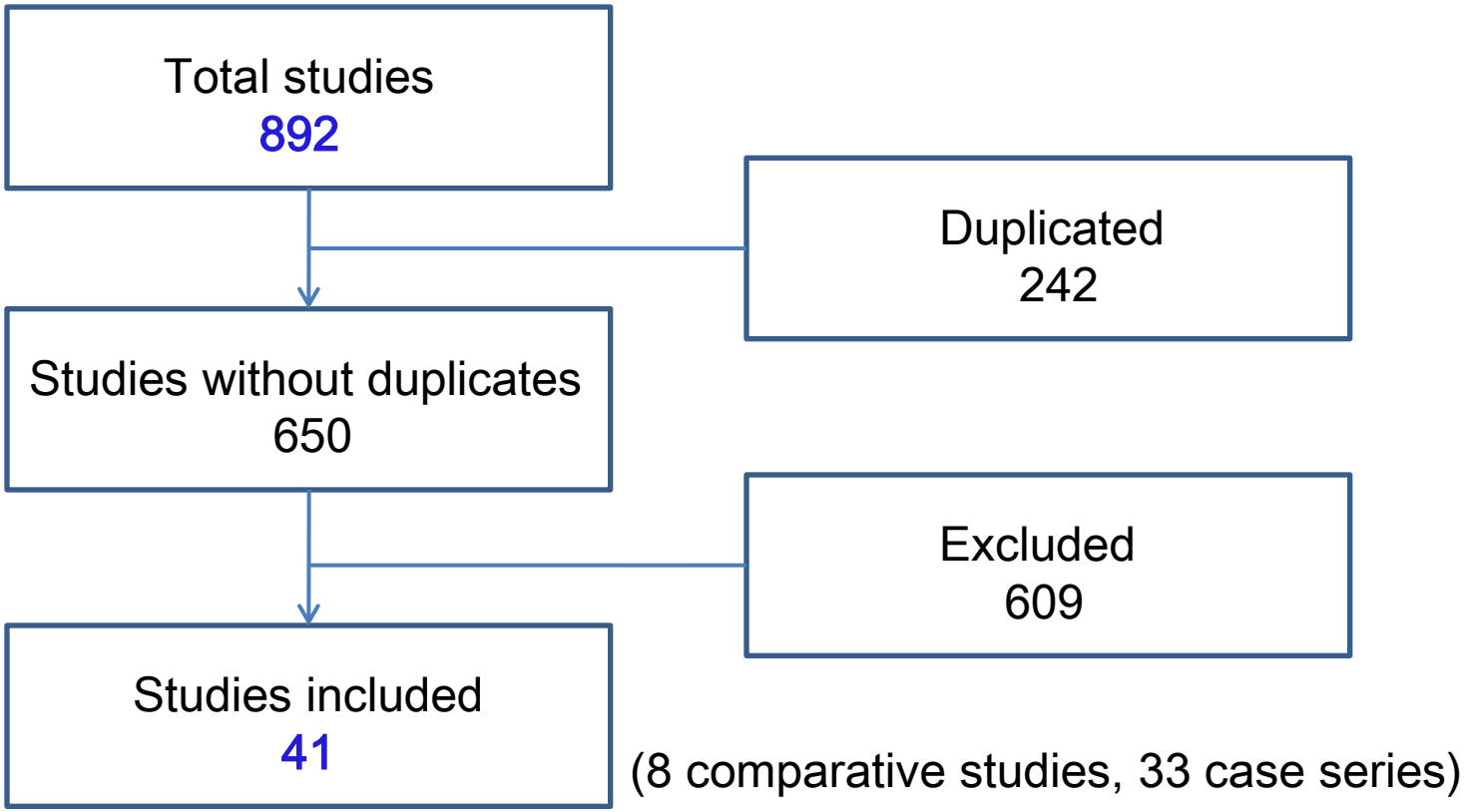
Products Services Priorities News Events

METHODS

2. Selection criteria
   - Inclusion criteria
     - Primary studies performing iodine-125 permanent implant for localized prostate cancer
   - Exclusion criteria
     - Animal and pre-clinical studies
     - Not in Korean and English
     - Editorial, editorial, letter, comment, opinion pieces, review, guideline, note, news article
     - Case report

METHODS

Study selection process



(8 comparative studies, 33 case series)

METHODS

3. Quality assessment
   - Scottish Intercollegiate Guidelines Network(SIGN) 'Methodology Checklist'

4. Data collection
   - Study information, patient characteristics, intervention, safety and effectiveness results

RESULTS

Comparative studies

Intervention(num)	Pubyear	Author	Comparators(num)
Monotherapy(52)	2009	Pinkawa	EBRT(52)
Monotherapy(225)	2009	Wong	3DCRT(270), IMRT(314)
Monotherapy(216)	2008	Eade	IMRT(158)
Monotherapy(350)	2007	Colberg	RP(391)
Monotherapy(74)	2007	Frank	RP(234), EBRT(135)
Monotherapy(87)	2005	Tsui	3DCRT(76)
Boost therapy(475)	2009	D'Amico	Monotherapy(867)
Boost therapy(81)	2009	Nobes	Monotherapy(319)

EBRT(External Beam Radiation Therapy); 3DCRT(3-Dimensional Conformal RadioTherapy);
IMRT(Intensity Modified Radiation Therapy); RP(Radical Prostatectomy)

RESULTS

Case series

Intervention	Studies	Patients
Monotherapy	32	14,165
Boost therapy	2	364
Salvage therapy	3	85

Monotherapy: brachytherapy only

Boost therapy: brachythrapy with EBRT

Salvage therapy: brachytherapy performing after first treatment failure

RESULTS – Safety

- Urinary toxicity
- Bowel Toxicity
- Sexual function

RESULTS – Effectiveness

- Biochemical disease-free survival rate
  - After undergoing a prostate cancer treatment the patient's PSA level does not rise for 2ng/ml to 3ng/ml consecutively

- Recurrence rate

RESULTS – Monotherapy

(Safety) Urinary toxicity

RTOG	Acute		Late	
	Mono	EBRT	**Mono**	EBRT
Grade 2	**68%**	39-49%	**45%**	16-27%
Grade 3	**3.8-6%**	1-3%	**5.6-18%**	0.5-5%
Grade 4	**0%**	0%	**0%**	0%

EBRT(External Beam Radiation Therapy); RTOG (Toxicity Criteria of Radiation Therapy Oncology Group)

RESULTS – Monotherapy

(Safety) Bowel toxicity

RTOG	Acute		Late	
	Mono	EBRT	Mono	EBRT
Grade 2	8%	45-54%	12%	14-15%
Grade 3	0%	1%	1%	1-2%
Grade 4	0%	0%	0%	0%

EBRT(External Beam Radiation Therapy); RTOG (Toxicity Criteria of Radiation Therapy Oncology Group)

RESULTS – Monotherapy

(Safety) Sexual function

	Mono	EBRT	RP
Functioning	**38**	28	25
Discomfort	**49**	50	45

EBRT(External Beam Radiation Therapy); RP(Radical Prostatectomy)

RESULTS – Monotherapy

(Effectiveness) Biochemical disease-free survival rate

Risk group(5yrs)	Mono	RP
Low	**92%**	93%
Moderate	**70%**	60%
High	**52%**	50%

EBRT(External Beam Radiation Therapy); RP(Radical Prostatectomy)

RESULTS – Boost therapy

(Safety) Urinary toxicity

RTOG	Acute			Late		
	Boost	Mono	EBRT	**Boost**	Mono	EBRT
Grade 2	**73%**	68%	39-49%	**52%**	45%	16-27%
Grade 3	**2%**	6%	1-3%	**18%**	18%	5%
Grade 4	**0%**	0%	0%	**0%**	05	0%

EBRT(External Beam Radiation Therapy); RTOG (Toxicity Criteria of Radiation Therapy Oncology Group)

RESULTS – Boost therapy

(Safety) Bowel toxicity

RTOG	Acute			Late		
	Boost	Mono	EBRT	**Boost**	Mono	EBRT
Grade 2	**11%**	8%	45-54%	**23%**	12%	14-15%
Grade 3	**0%**	0%	1%	**5%**	1%	1-2%
Grade 4	**0%**	0%	0%	**0%**	0%	0%

EBRT(External Beam Radiation Therapy); RTOG (Toxicity Criteria of Radiation Therapy Oncology Group)

RESULTS – Boost therapy

(Effectiveness) Biochemical disease-free survival rate

Risk group	Intervention	Patients	5yrs Survival Rate
Low	Mono	8	97%
	Boost	**116**	**100%**
Middle	Mono	19	83%
	Boost	**32**	**100%**
High	Mono	5	50%
	Boost	**3**	**100%**

DISCUSSION

- Limited evidence
  - Eight comparative studies
  - There is insufficient evidence of salvage therapy to demonstrate effectiveness.

CONCLUSIONS

- Monotherapy is possible treatment for patients with low/intermediate risk groups
- Boost therapy is possible treatment for patients with intermediate/high risk groups
- MSAC's recommendation
  - At clinical stages T1 and T2 with Gleason scores of less than or equal to 6, prostate specific antigen (PSA) of less than or equal to 10ng/mL, gland volume less than 40cc and with life expectancy of more than 10 years

Thank you

ujin@neca.re.kr