



WICHITA UROLOGY

Update on Prostate Cancer: Screening controversies and treatment

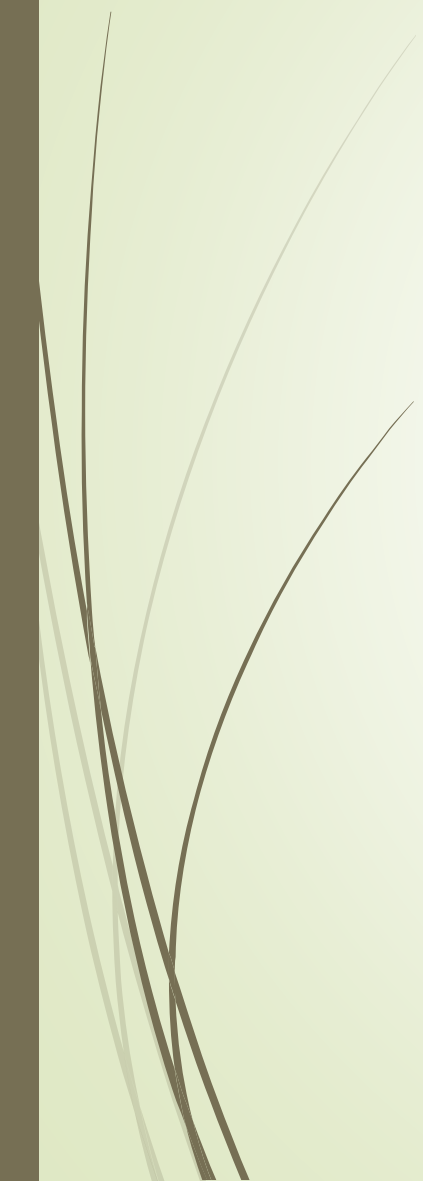
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Wichita Urology Group

Nov 12, 2021



Learning Objectives

- Be familiar with the epidemiology of prostate cancer
 - Know the national guidelines on prostate cancer screening
 - Recognize the different treatment options for prostate cancer
 - Be familiar with minimally invasive robotic prostate surgery
- 





2021 Statistics

- ▶ Prostate cancer continues to be the most common (nonskin) cancer in men in the US
- ▶ Prostate cancer is the **second** leading cause of cancer death in men, exceeded only by lung cancer
- ▶ Estimated 248,530 new diagnoses
- ▶ Estimated 34,130 cancer-related deaths

Cancer Statistics 2012

Estimated New Cases*

| | | | Males | Females | | |
|-----------------------|----------------|-------------|---|--|-----------------------|---------------------|
| Prostate | 241,740 | 29% |  |  | Breast | 226,870 29% |
| Lung & bronchus | 116,470 | 14% | | | Lung & bronchus | 109,690 14% |
| Colon & rectum | 73,420 | 9% | | | Colon & rectum | 70,040 9% |
| Urinary bladder | 55,600 | 7% | | | Uterine corpus | 47,130 6% |
| Melanoma of the skin | 44,250 | 5% | | | Thyroid | 43,210 5% |
| Kidney & renal pelvis | 40,250 | 5% | | | Melanoma of the skin | 32,000 4% |
| Non-Hodgkin lymphoma | 38,160 | 4% | | | Non-Hodgkin lymphoma | 31,970 4% |
| Oral cavity & pharynx | 28,540 | 3% | | | Kidney & renal pelvis | 24,520 3% |
| Leukemia | 26,830 | 3% | | | Ovary | 22,280 3% |
| Pancreas | 22,090 | 3% | | | Pancreas | 21,830 3% |
| All Sites | 848,170 | 100% | | | All Sites | 790,740 100% |

Estimated Deaths





| | | | Males | Females | | |
|--------------------------------|----------------|-------------|--|---|--------------------------------|---------------------|
| Lung & bronchus | 87,750 | 29% |  |  | Lung & bronchus | 72,590 26% |
| Prostate | 28,170 | 9% | | | Breast | 39,510 14% |
| Colon & rectum | 26,470 | 9% | | | Colon & rectum | 25,220 9% |
| Pancreas | 18,850 | 6% | | | Pancreas | 18,540 7% |
| Liver & intrahepatic bile duct | 13,980 | 5% | | | Ovary | 15,500 6% |
| Leukemia | 13,500 | 4% | | | Leukemia | 10,040 4% |
| Esophagus | 12,040 | 4% | | | Non-Hodgkin lymphoma | 8,620 3% |
| Urinary bladder | 10,510 | 3% | | | Uterine Corpus | 8,010 3% |
| Non-Hodgkin lymphoma | 10,320 | 3% | | | Liver & intrahepatic bile duct | 6,570 2% |
| Kidney & renal pelvis | 8,650 | 3% | | | Brain & other nervous system | 5,980 2% |
| All Sites | 301,820 | 100% | | | All Sites | 275,370 100% |

FIGURE 1. Ten Leading Cancer Types for the Estimated New Cancer Cases and Deaths by Sex, United States, 2012.



*Estimates are rounded to the nearest 10 and exclude basal and squamous cell skin cancers and in situ carcinoma except urinary bladder.

Cancer Statistics 2019

Estimated New Cases

| | | | Males | Females | | | |
|-----------------------|----------------|-------------|---|--|-----------------------|----------------|-------------|
| Prostate | 174,650 | 20% |  |  | Breast | 268,600 | 30% |
| Lung & bronchus | 116,440 | 13% | | | Lung & bronchus | 111,710 | 13% |
| Colon & rectum | 78,500 | 9% | | | Colon & rectum | 67,100 | 8% |
| Urinary bladder | 61,700 | 7% | | | Uterine corpus | 61,880 | 7% |
| Melanoma of the skin | 57,220 | 7% | | | Melanoma of the skin | 39,260 | 4% |
| Kidney & renal pelvis | 44,120 | 5% | | | Thyroid | 37,810 | 4% |
| Non-Hodgkin lymphoma | 41,090 | 5% | | | Non-Hodgkin lymphoma | 33,110 | 4% |
| Oral cavity & pharynx | 38,140 | 4% | | | Kidney & renal pelvis | 29,700 | 3% |
| Leukemia | 35,920 | 4% | | | Pancreas | 26,830 | 3% |
| Pancreas | 29,940 | 3% | | | Leukemia | 25,860 | 3% |
| All Sites | 870,970 | 100% | | | All Sites | 891,480 | 100% |

Estimated Deaths

| | | | Males | Females | | | |
|--------------------------------|----------------|-------------|--|---|--------------------------------|----------------|-------------|
| Lung & bronchus | 76,650 | 24% |  |  | Lung & bronchus | 66,020 | 23% |
| Prostate | 31,620 | 10% | | | Breast | 41,760 | 15% |
| Colon & rectum | 27,640 | 9% | | | Colon & rectum | 23,380 | 8% |
| Pancreas | 23,800 | 7% | | | Pancreas | 21,950 | 8% |
| Liver & intrahepatic bile duct | 21,600 | 7% | | | Ovary | 13,980 | 5% |
| Leukemia | 13,150 | 4% | | | Uterine corpus | 12,160 | 4% |
| Esophagus | 13,020 | 4% | | | Liver & intrahepatic bile duct | 10,180 | 4% |
| Urinary bladder | 12,870 | 4% | | | Leukemia | 9,690 | 3% |
| Non-Hodgkin lymphoma | 11,510 | 4% | | | Non-Hodgkin lymphoma | 8,460 | 3% |
| Brain & other nervous system | 9,910 | 3% | | | Brain & other nervous system | 7,850 | 3% |
| All Sites | 321,670 | 100% | | | All Sites | 285,210 | 100% |



Statistics

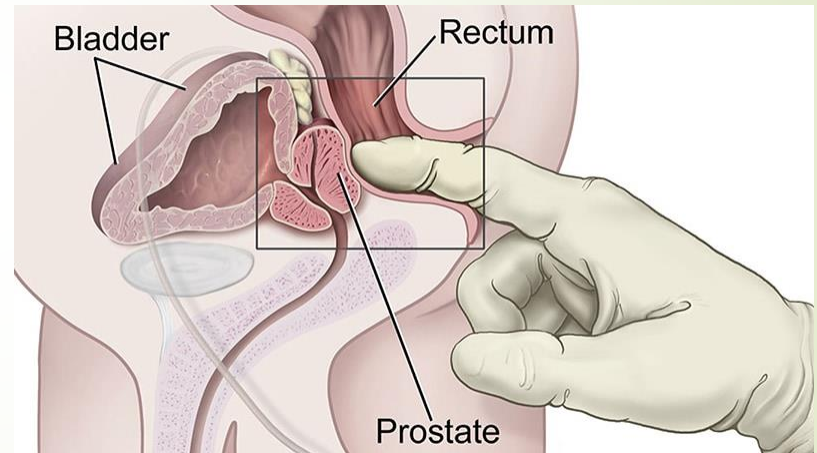


- Majority of men diagnosed with prostate cancer will die from other causes
- Autopsy results show 30% of men older than 50 years of age and 70% of men older than 70 years have occult prostate cancer
- 10 year risk of death from prostate cancer is 8% for well differentiated cancer and 26% for poorly differentiated cancer

Coley et al. Ann Int Med 1997

Early Detection

- Digital Rectal exam (DRE)**
- Prostate Specific Antigen blood test (PSA)
- 15% of men with prostate cancer have a normal PSA



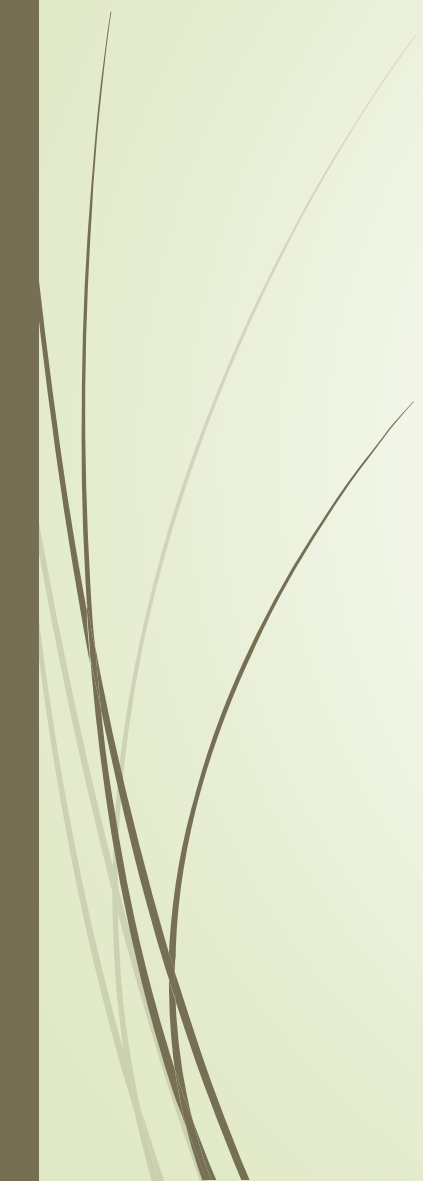


PSA Screening

- PSA is a protein produced by the prostate
- It is specific to the prostate but not to prostate cancer , as other factors like infection, instrumentation, or inflammation of the prostate can cause an elevated PSA**



PSA Screening

- ▶ Prostate cancer that is felt by rectal exam represents a higher stage than one diagnosed by biopsy done due to elevated PSA
 - ▶ Prostate cancer does not cause any symptoms in its early stages and thus the importance of the screening PSA test.
- 



Social determinants

- ▶ African Americans have the highest incidence of prostate cancer in the US . Studies have shown that AA are less likely to pursue screening compared to other ethnic groups
- ▶ Barriers to screening include lack of access to healthcare and socioeconomic status

Smith et al
Cur Rep Urol
2017

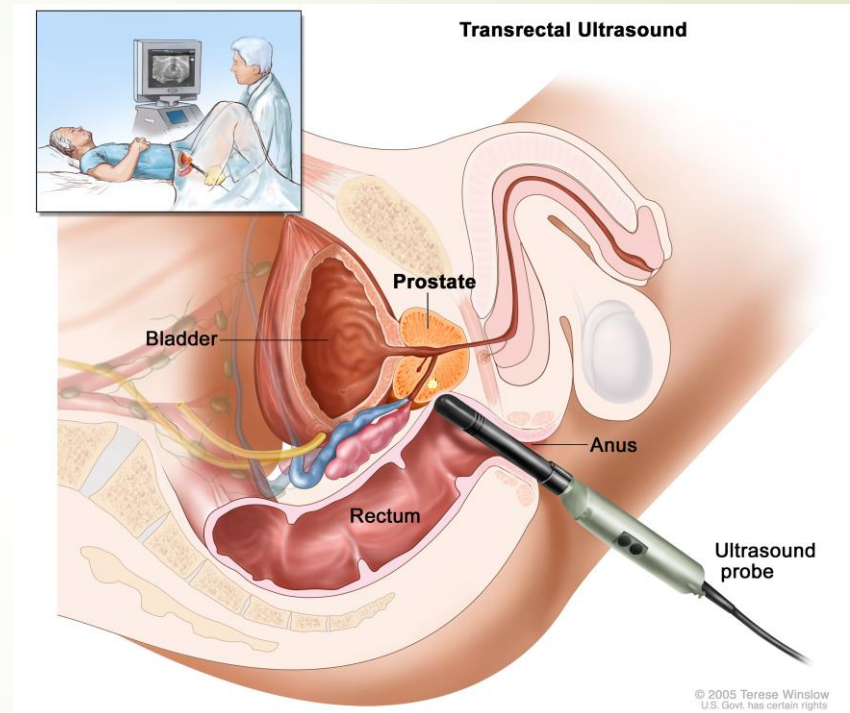


Improving diagnostic accuracy of PSA*

- ▶ PSA velocity (> 0.75 ng/ml/year)
- ▶ % free PSA
- ▶ PSA density
- ▶ Age adjusted PSA
 - 40-49 ≤ 2.5
 - 50-59 ≤ 3.5
 - 60-69 ≤ 4.6
 - 70-79 ≤ 6.5

Prostate biopsy

- Any abnormality in the PSA or DRE will require
- Biopsy of the prostate
- Role of multiparametric MRI**

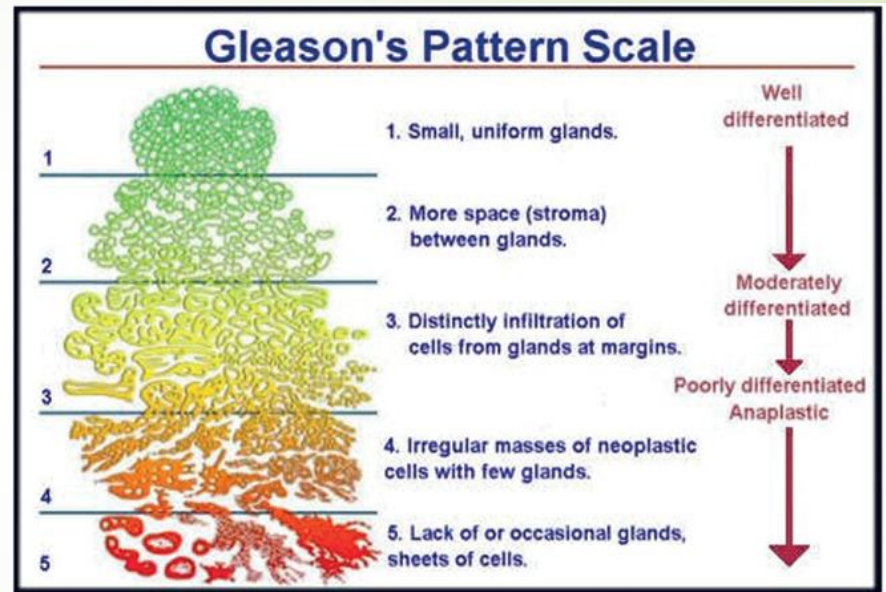


<https://www.cancer.gov/publications/dictionaries/cancer-terms/def/endorectal-ultrasound>

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Biopsy results

- ▶ Prostate cancer graded on appearance of cancer cells
- ▶ Gleason grading system
 - ▶ Gleason grade ranges from 1 (least aggressive) to 5 (most aggressive)
- ▶ Gleason score (2-10)
 - ▶ Most common cell grade (first) added to second most common cell grade
 - ▶ i.e Gleason 7 (3+4)



Source: John Murtagh, Jill Rosenblatt, Justin Coleman, Clare Murtagh: *John Murtagh's General Practice*, 7e
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New Grading System (2016)

- Grade Group 1: Gleason <
- Grade Group 2: Gleason 3
- Grade Group 3: Gleason 4
- Grade Group 4: Gleason s
- Grade Group 5: Gleason s

| Gleason Score | Grade Group | Characteristics |
|---------------|---------------|--|
| 6 | Grade Group 1 | <ul style="list-style-type: none">• Less aggressive• Very slow growing• Low risk |
| 3 + 4 = 7 | Grade Group 2 | <ul style="list-style-type: none">• Slightly aggressive• Slow growing• Low to Intermediate risk |
| 4 + 3 = 7 | Grade Group 3 | <ul style="list-style-type: none">• Moderately aggressive• Fast growing• Intermediate to High risk |
| 8 | Grade Group 4 | <ul style="list-style-type: none">• Aggressive• Rapidly growing• High risk |
| 9-10 | Grade Group 5 | <ul style="list-style-type: none">• Highly aggressive• Rapidly growing• High risk |

Does screening save lives?

EORTC trial (Europe) : YES*

PLCO trial (US) : NO ???

USPSTF



PSA Screening Controversy

- In October 2011, The United States Preventive Services Task Force (USPSTF) issued a recommendation discouraging the use of PSA for prostate cancer screening.
- The concern that the USPSTF raises is that having this test “has no net benefit or the harms outweigh the benefits”




Factors Overlooked by USPSTF

- USPSTF opposes PSA testing regardless of age.
- The expected life span for a man aged 75 years is approximately 10 years but reaches 30 years for men at age 45 to 50 years.
- Opposing screening for young men can result in delayed diagnosis of curable cancer.



Factors Overlooked by USPSTF

- ▶ In the ERSPC trial, higher-grade cancer (Gleason score ≥ 7) was more common in the control group (45.2%) versus the screened group (27.8%), with a 40% greater incidence of locally advanced and metastatic cancer
- ▶ Advanced prostate cancer can be associated with painful bone metastases, pathologic fractures, and urinary tract obstruction. They will need more harmful and invasive procedures



Factors Overlooked by USPSTF

- The Task Force did not take into consideration high risk patients, like African American patients and those with family history of prostate cancer



Impact of PSA

- ▶ In 1990, 21% of men at diagnosis had bone metastases
- ▶ Compare to 4% in 2012!!
- ▶ Without PSA, men will present when they become symptomatic which is too late of a stage to cure



PSA Screening

- The American Urological Association (AUA) recommends **shared decision-making** for men age 55 to 69 especially those with 10-15 years life expectancy
- Screening is especially important in high risk patients, African Americans and patients with family history (start at age 40)
- Some men age 70 or older who are in excellent health may benefit from screening



American Cancer Society recommendations

- **Age 50 for men who are at average risk** of prostate cancer and are expected to live at least 10 more years
- **Age 45 for men at high risk** of developing prostate cancer. This includes African Americans and men who have a first-degree relative (father or brother) diagnosed with prostate cancer at an early age (younger than age 65)
- **Age 40 for men at even higher risk** (those with more than one first-degree relative who had prostate cancer at an early age)*

<https://www.cancer.org/cancer/prostate-cancer/detection-diagnosis-staging/acs-recommendations.html>



PSA Screening



- ▶ Since the introduction of the PSA in the early 1990's , there has been a 40% decrease in prostate cancer mortality as patients are being diagnosed at an earlier and more curable stage
- ▶ While everyone realizes that the PSA test has its limitations, the fact that we saw stage migration and men being diagnosed at an earlier stage, represents a strong argument to continue (in selected patients) including the test as part of the annual prostate cancer screening.



Practical Points (Urologist's Perspective)

- Not all patients need to be screened (multiple comorbidities , short life expectancy)
- Not all patients get biopsied
- Not all patients get treatment (watchful waiting and active surveillance)
- New genomic tests that help with risk stratification
- Emerging role for MRI (MRI for elevated PSA)



USPSTF

- In Spring of 2017, USPSTF released a draft recommendation that encourages clinicians to discuss the benefits and harms of PSA screening in men aged 55 to 69. While this new draft recommendation does not address high risk patients and men younger than 55 years of age, this is a good start !

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- Recommendations
 - Published Final Recommendations
 - Recommendations in Progress
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- Information for Consumers
- Public Comments and Nominations
- Methods and Processes
- About the USPSTF
- Newsroom
- Announcements

You are here: [Home](#) » [Recommendations for Primary Care Practice](#) » [Published Recommendations](#) » [Recommendation Summary](#) » [Final Recommendation Statement : Final Recommendation Statement](#)

Final Recommendation Statement

Prostate Cancer: Screening

Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

For more information on the final recommendation on screening for prostate cancer, go to www.screeningforprostatecancer.org.


Recommendation Summary

| Population | Recommendation | Grade (What's This?) |
|-------------------------|--|-------------------------|
| Men aged 55 to 69 years | For men aged 55 to 69 years, the decision to undergo periodic prostate-specific antigen (PSA)-based screening for prostate cancer should be an individual one. Before deciding whether to be screened, men should have an opportunity to discuss the potential benefits and harms of screening with their clinician and to incorporate their values and preferences in the decision. Screening offers a small potential benefit of reducing the chance of death from prostate cancer in some men. However, many men will experience potential harms of screening, including false-positive results that require additional testing and possible prostate biopsy; overdiagnosis and overtreatment; and treatment complications, such as incontinence and erectile dysfunction. In determining whether this service is appropriate in individual cases, patients and clinicians should consider the balance of benefits and harms on the basis of family history, race/ethnicity, comorbid medical conditions, patient values about the benefits and harms of screening and treatment-specific outcomes, and other health needs. Clinicians should not screen men who do not express a preference for screening. | C |
| Men 70 years and older | The USPSTF recommends against PSA-based screening for prostate cancer in men 70 years and older. | D |



Prostate Cancer

- Localized vs locally advanced vs metastatic
- Clinical stage T1c: diagnosed by biopsy done for elevated PSA
- cT2: firmness felt on rectal exam !!



Prostate Cancer Treatment Options

Dependent upon.....

- Stage of disease
- Patient's age and health
- Patient's personal preference



Treatment Options (Early Diagnosis)

- ▶ Active surveillance / Watchful waiting
- ▶ External Beam Radiation Therapy
- ▶ Brachytherapy (Radioactive seeds)
- ▶ Cryosurgery (Freezing prostate)
- ▶ Surgery (Radical Prostatectomy)
 - ▶ Open Surgery
 - ▶ Conventional Laparoscopic Surgery
 - ▶ *da Vinci*[™] Prostatectomy (Robotic-Assisted Surgery)

Does prostatectomy save lives?

The New England Journal of Medicine

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A RANDOMIZED TRIAL COMPARING RADICAL PROSTATECTOMY WITH WATCHFUL WAITING IN EARLY PROSTATE CANCER

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JAN-ERIK JOHANSSON, M.D., PH.D., AND BO JOHAN NORLEN, M.D., PH.D.,
FOR THE SCANDINAVIAN PROSTATIC CANCER GROUP STUDY NUMBER 4*

ORIGINAL ARTICLE

Radical Prostatectomy versus Watchful Waiting in Early Prostate Cancer

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ABSTRACT

BACKGROUND

In 2008, we reported that radical prostatectomy, as compared with watchful waiting, reduces the rate of death from prostate cancer. After an additional 3 years of follow-up, we now report estimated 15-year results.

METHODS

From October 1989 through February 1999, we randomly assigned 695 men with early prostate cancer to watchful waiting or radical prostatectomy. Follow-up was complete through December 2009, with histopathological review of biopsy and radical-prostatectomy specimens and blinded evaluation of causes of death. Relative risks, with 95% confidence intervals, were estimated with the use of a Cox proportional-hazards model.

RESULTS

During a median of 12.8 years, 166 of the 347 men in the radical-prostatectomy group and 201 of the 348 in the watchful-waiting group died ($P=0.007$). In the case of 55 men assigned to surgery and 81 men assigned to watchful waiting, death was due to prostate cancer. This yielded a cumulative incidence of death from prostate cancer at 15 years of 14.6% and 20.7%, respectively (a difference of 6.1 percentage points; 95% confidence interval [CI], 0.2 to 12.0), and a relative risk with surgery of 0.62 (95% CI, 0.44 to 0.87; $P=0.01$). The survival benefit was similar before and after 9 years of follow-up, was observed also among men with low-risk prostate cancer, and was confined to men younger than 65 years of age. The number needed to treat to avert one death was 15 overall and 7 for men younger than 65 years of age. Among men who underwent radical prostatectomy, those with extracapsular tumor growth had a risk of death from prostate cancer that was 7 times that of men without extracapsular tumor growth (relative risk, 6.9; 95% CI, 2.6 to 18.4).

CONCLUSIONS

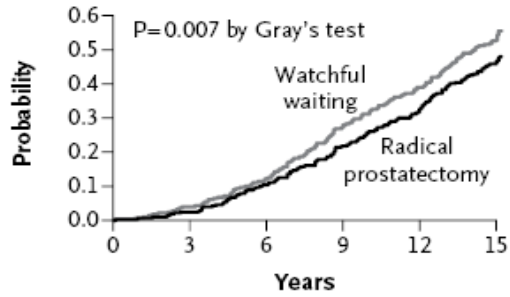
Radical prostatectomy was associated with a reduction in the rate of death from prostate cancer. Men with extracapsular tumor growth may benefit from adjuvant local or systemic treatment. (Funded by the Swedish Cancer Society and the National Institutes of Health.)



Even longer follow up

- ▶ March 2014 NEJM
- ▶ Median 13.4 years follow up
- ▶ Number needed to treat to avert one death was 7 overall and 4 for those younger than 65 years of age

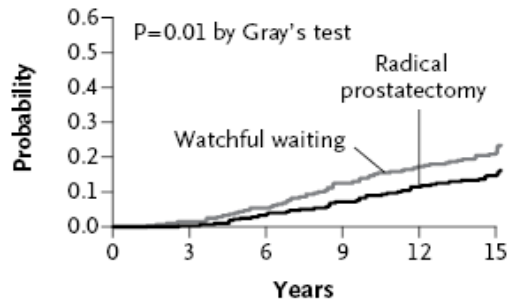
A Death from Any Cause, Total Cohort



No. at Risk

| | | | | | | |
|-----------------------|-----|-----|-----|-----|-----|-----|
| Radical prostatectomy | 347 | 339 | 311 | 271 | 214 | 109 |
| Watchful waiting | 348 | 334 | 306 | 251 | 192 | 96 |

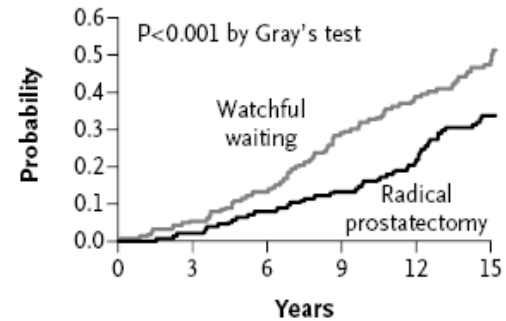
B Death from Prostate Cancer, Total Cohort



No. at Risk

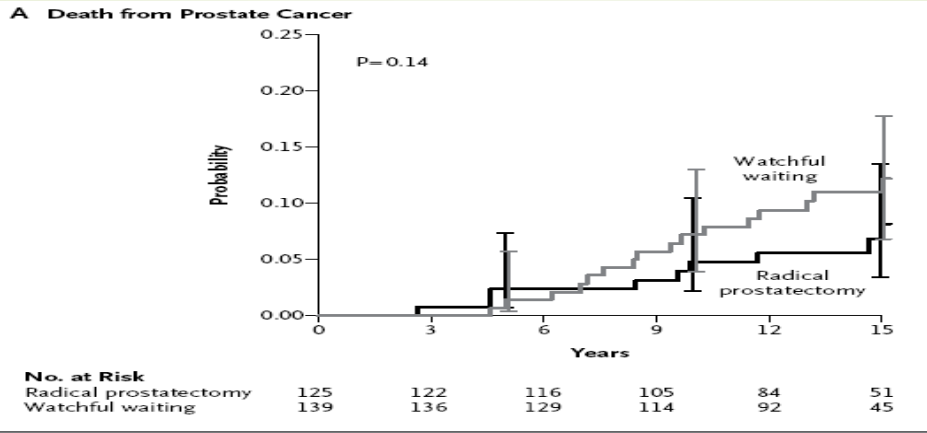
| | | | | | | |
|-----------------------|-----|-----|-----|-----|-----|-----|
| Radical prostatectomy | 347 | 339 | 311 | 271 | 214 | 109 |
| Watchful waiting | 348 | 334 | 306 | 251 | 192 | 96 |

G Death from Any Cause, Men <65 Yr of Age



No. at Risk

| | | | | | | |
|-----------------------|-----|-----|-----|-----|-----|----|
| Radical prostatectomy | 157 | 154 | 145 | 136 | 115 | 67 |
| Watchful waiting | 166 | 157 | 144 | 118 | 91 | 54 |



Low risk patients

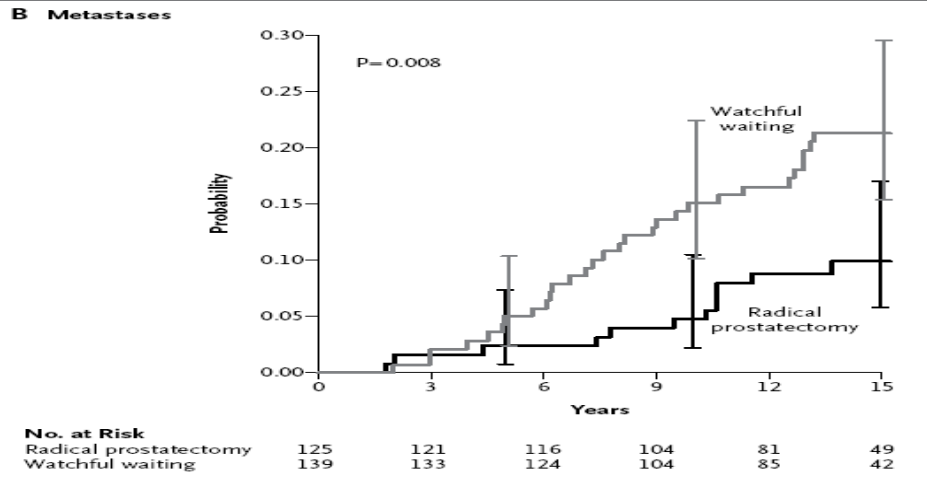


Figure 2. Cumulative Incidence of Death from Prostate Cancer and Development of Metastases among Men with Low-Risk Prostate Cancer.
 The cumulative incidence of death from prostate cancer and the development of metastases among men with low-risk prostate cancer (PSA level of <10 and a tumor with a Gleason score of <7 or a WHO grade of 1) is shown. P values refer to absolute between-group differences at 15 years. I bars represent 95% confidence intervals for the cumulative incidence at the 5-year, 10-year, and 15-year follow-up points.

Radical Prostatectomy or Watchful Waiting in Prostate Cancer — 29-Year Follow-up

Anna Bill-Axelsson, M.D., Ph.D., Lars Holmberg, M.D., Ph.D., Hans Garmo, Ph.D., Kimmo Taari, M.D., Ph.D., Christer Busch, M.D., Ph.D., Stig Nordling, M.D., Ph.D., Michael Häggman, M.D., Ph.D., Swen-Olof Andersson, M.D., Ph.D., Ove Andrén, M.D., Ph.D., Gunnar Steineck, M.D., Ph.D., Hans-Olov Adami, M.D., Ph.D., and Jan-Erik Johansson, M.D., Ph.D.

ABSTRACT

BACKGROUND

Radical prostatectomy reduces mortality among men with clinically detected localized prostate cancer, but evidence from randomized trials with long-term follow-up is sparse.

METHODS

We randomly assigned 695 men with localized prostate cancer to watchful waiting or radical prostatectomy from October 1989 through February 1999 and collected follow-up data through 2017. Cumulative incidence and relative risks with 95% confidence intervals for death from any cause, death from prostate cancer, and metastasis were estimated in intention-to-treat and per-protocol analyses, and numbers of years of life gained were estimated. We evaluated the prognostic value of histopathological measures with a Cox proportional-hazards model.

RESULTS

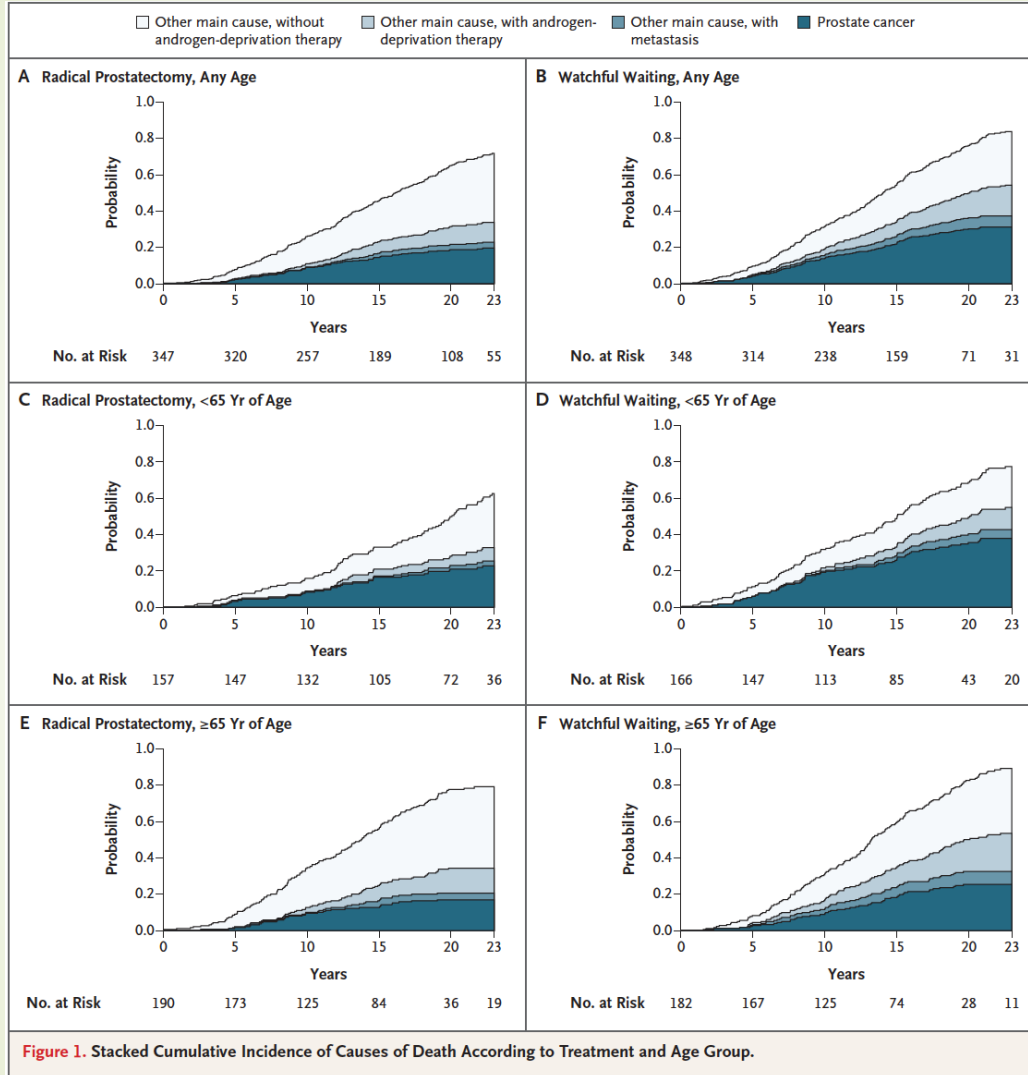
By December 31, 2017, a total of 261 of the 347 men in the radical-prostatectomy group and 292 of the 348 men in the watchful-waiting group had died; 71 deaths in the radical-prostatectomy group and 110 in the watchful-waiting group were due to prostate cancer (relative risk, 0.55; 95% confidence interval [CI], 0.41 to 0.74; $P < 0.001$; absolute difference in risk, 11.7 percentage points; 95% CI, 5.2 to 18.2). The number needed to treat to avert one death from any cause was 8.4. At 23 years, a mean of 2.9 extra years of life were gained with radical prostatectomy. Among the men who underwent radical prostatectomy, extracapsular extension was associated with a risk of death from prostate cancer that was 5 times as high as that among men without extracapsular extension, and a Gleason score higher than 7 was associated with a risk that was 10 times as high as that with a score of 6 or lower (scores range from 2 to 10, with higher scores indicating more aggressive cancer).

CONCLUSIONS

Men with clinically detected, localized prostate cancer and a long life expectancy benefited from radical prostatectomy, with a mean of 2.9 years of life gained. A high Gleason score and the presence of extracapsular extension in the radical prostatectomy specimens were highly predictive of death from prostate cancer. (Funded by the Swedish Cancer Society and others.)

29 year follow up

- After 29 years of follow up, at a time when 80% of the participants have died, lower overall mortality, lower mortality due to prostate cancer, and a lower risk of metastases have prevailed in the prostatectomy group
- Number needed to treat to avert one death from any cause was 8.4
- At 23 years, a mean of 2.9 years of life were gained with radical prostatectomy



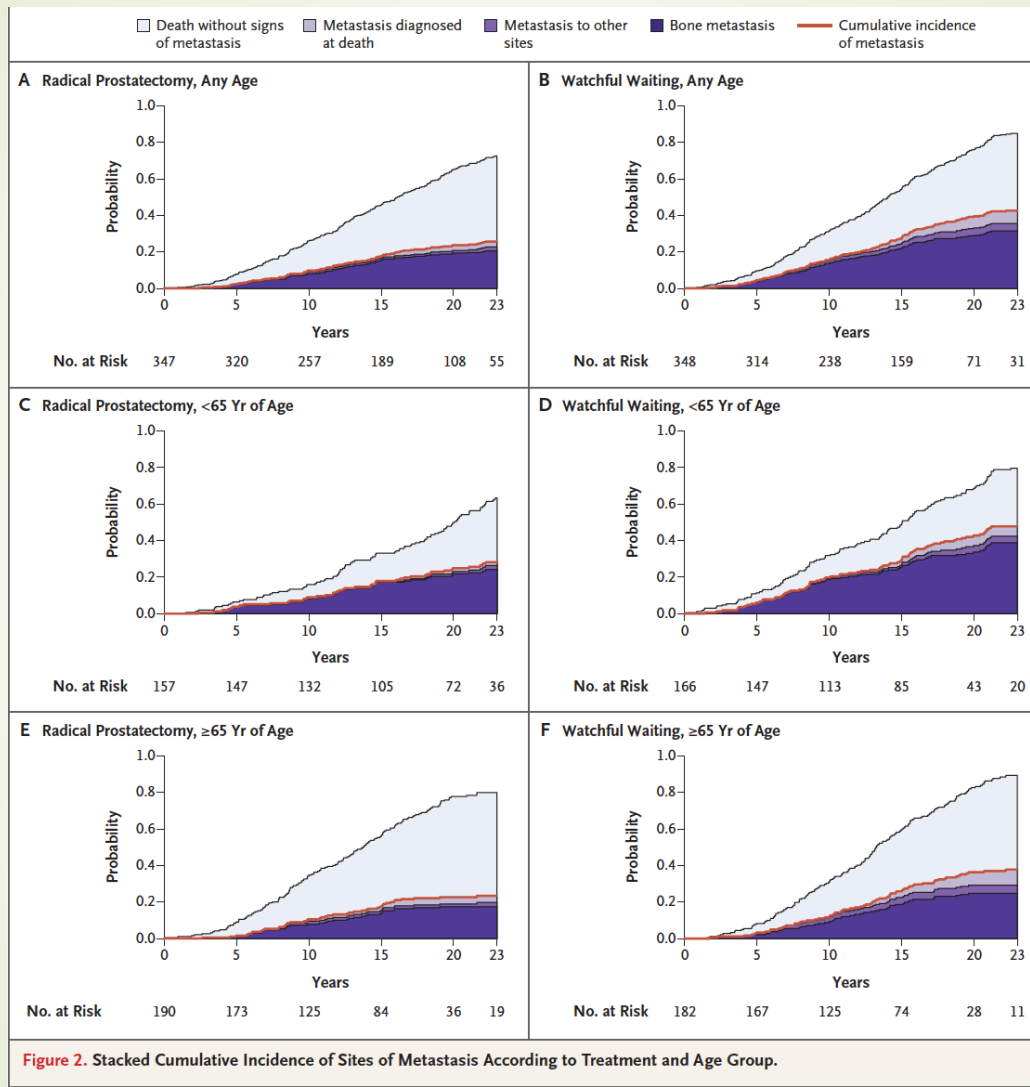


Table 2. End-Point Estimates at 23 Years and Relative Risk Over the 29-Year Trial Period.*

| End Point | Radical Prostatectomy | | Watchful Waiting | | Absolute Difference in Risk at 23 Yr (95% CI) <i>percentage points</i> | No. Needed to Treat to Prevent End Point at 23 Yr (95% CI) | Relative Risk, Radical Prostatectomy vs. Watchful Waiting (95% CI)† | P Value‡ |
|-------------------------------------|------------------------------|-------------------------------------|------------------------------|-------------------------------------|---|--|---|----------|
| | No. of Events/ Total No.§ | Cumulative Incidence at 23 Yr¶ % | No. of Events/ Total No.§ | Cumulative Incidence at 23 Yr¶ % | | | | |
| Death from any cause | | | | | | | | |
| All patients | 261/347 | 71.9 (67.0–77.0) | 292/348 | 83.8 (79.8–88.1) | 12.0 (5.5–18.4) | 8.4 (5.4–18.2) | 0.74 (0.62–0.87) | <0.001 |
| Patients <65 yr of age | 105/157 | 62.6 (55.1–71.2) | 129/166 | 77.6 (71.1–84.7) | 15.0 (4.4–25.5) | 6.7 (3.9–22.6) | 0.62 (0.48–0.80) | — |
| Patients ≥65 yr of age | 156/190 | 79.2 (73.4–85.4) | 163/182 | 89.3 (84.6–94.3) | 10.1 (2.4–17.8) | 9.9 (5.6–41.4) | 0.86 (0.69–1.07) | — |
| Death from prostate cancer | | | | | | | | |
| All patients | 71/347 | 19.6 (15.8–24.4) | 110/348 | 31.3 (26.8–36.6) | 11.7 (5.2–18.2) | 8.6 (5.5–19.3) | 0.55 (0.41–0.74) | <0.001 |
| Patients <65 yr of age | 39/157 | 22.8 (17.0–30.6) | 63/166 | 37.9 (31.1–46.3) | 15.1 (5.0–25.2) | 6.6 (4.0–20.0) | 0.50 (0.34–0.75) | — |
| Patients ≥65 yr of age | 32/190 | 16.9 (12.3–23.1) | 47/182 | 25.3 (19.7–32.6) | 8.5 (0.2–16.8) | 11.8 (6.0–601.0) | 0.63 (0.40–0.99) | — |
| Distant metastasis** | | | | | | | | |
| All patients | 92/347 | 26.6 (22.3–31.7) | 150/348 | 43.3 (38.3–48.9) | 16.7 (9.6–23.7) | 6.0 (4.2–10.4) | 0.54 (0.42–0.70) | <0.001 |
| Patients <65 yr of age | 48/157 | 30.8 (24.3–39.0) | 81/166 | 49.4 (42.2–57.8) | 18.6 (7.9–29.2) | 5.4 (3.4–12.7) | 0.49 (0.34–0.70) | — |
| Patients ≥65 yr of age | 44/190 | 23.2 (17.9–30.0) | 69/182 | 37.7 (31.2–45.6) | 14.6 (5.2–23.9) | 6.9 (4.2–19.2) | 0.59 (0.41–0.86) | — |



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10-Year Outcomes after Monitoring, Surgery, or Radiotherapy for Localized Prostate Cancer

F.C. Hamdy, J.L. Donovan, J.A. Lane, M. Mason, C. Metcalfe, P. Holding, M. Davis, T.J. Peters, E.L. Turner, R.M. Martin, J. Oxley, M. Robinson, J. Staffurth, E. Walsh, P. Bollina, J. Catto, A. Doble, A. Doherty, D. Gillatt, R. Kockelbergh, H. Kynaston, A. Paul, P. Powell, S. Prescott, D.J. Rosario, E. Rowe, and D.E. Neal,
for the ProtecT Study Group*


CONCLUSIONS

At a median of 10 years, prostate-cancer-specific mortality was low irrespective of the treatment assigned, with no significant difference among treatments. Surgery and radiotherapy were associated with lower incidences of disease progression and metastases than was active monitoring. (Funded by the National Institute for Health Research; ProtecT Current Controlled Trials number, ISRCTN20141297; ClinicalTrials.gov number, NCT02044172.)

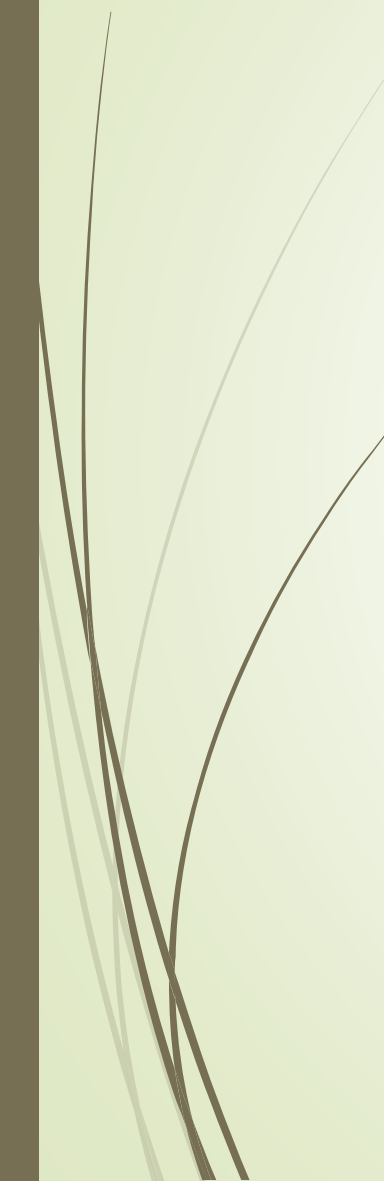


Surgical Perspective: Prostatectomy

- Open radical retropubic
- Laparoscopic
- Robotic assisted laparoscopic



Conventional Laparoscopic Surgery Drawbacks

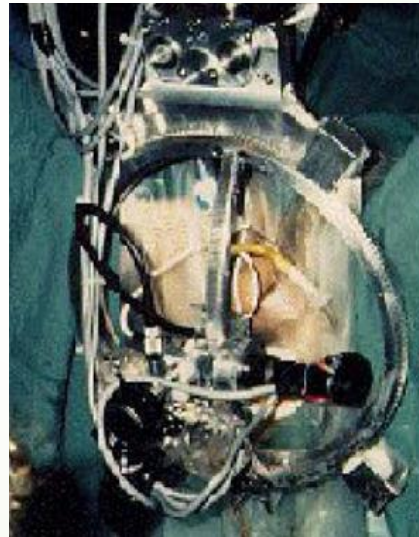
- 2-D flat image video
 - Rigid instruments
 - Instruments controlled at a distance
 - Decreases your surgeon's precision, dexterity and control
 - Higher surgeon fatigue
- 



How can we overcome these drawbacks?

- ▶ Provide a high resolution 3-D color image
- ▶ Interpose a computer between the surgeon's hand and the instrument tip
- ▶ Increase the surgeon's dexterity for the difficult aspects of the procedure
 - ▶ Sparing the nerves to preserve erectile function
 - ▶ Preserving continence

First Urologic Robot PROBOT - 1989



<https://www.imperial.ac.uk/mechatronics-in-medicine/research/probot/>

What is the *da Vinci*[®] Surgical System?



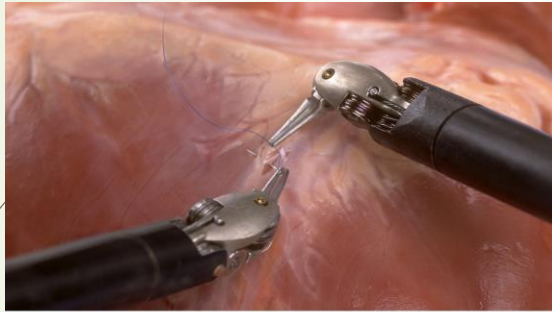
- ▶ Robotic technology
- ▶ Surgeon is in control and operates at the console
- ▶ Assistant surgeon is next to the patient

Vision System



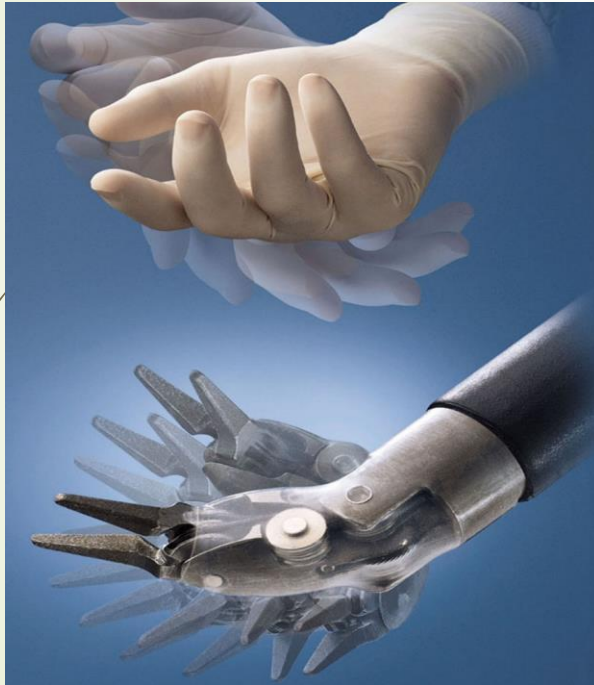
- ▶ Surgeon is immersed in 3-Dimensional image of the surgical field

The Surgeon Directs The Instruments



- The surgeon's hands are placed in special devices called masters that direct the precise instrument movements

Wrist and Finger Movement



- ▶ Traditional laparoscopic instruments are straight and do not bend
- ▶ *EndoWrist*[®] Instruments move like a human wrist
 - ▶ Allows increased dexterity, maneuverability, and precision

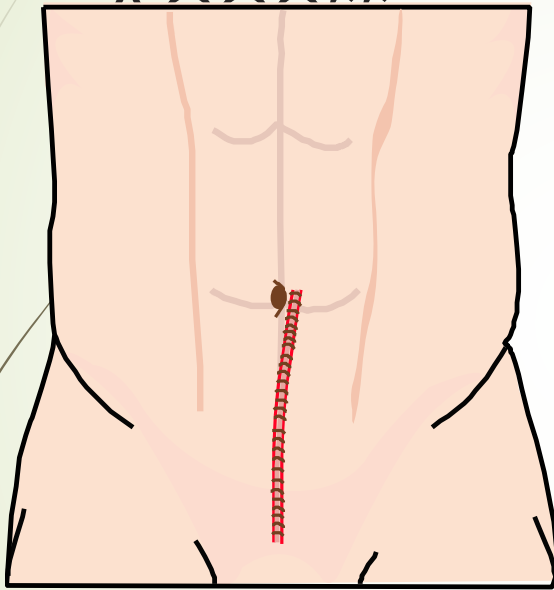
Small Instruments through Keyhole Incisions



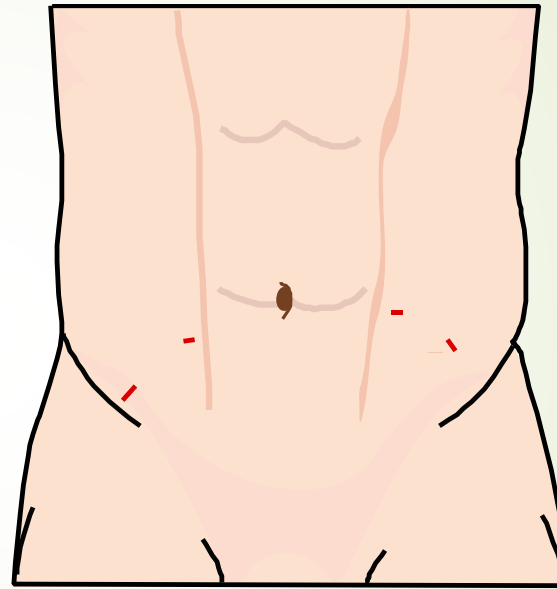
- ▶ *da Vinci*[®] Surgical System *EndoWrist*[®] Instruments are small and are able to fit through keyhole incisions
- ▶ A wide range of instruments are available

Robotic-Assisted Surgery

Access



Open Surgical Incision



da Vinci[™] Prostatectomy Incision



Benefits of robotic prostatectomy

- Decreased blood loss
- Shortened length of hospital stay ?
- Decreased postoperative pain ??
- Less scarring
- Shorter urinary catheter time
- Faster return to regular activities



Conclusions



- Prostate cancer screening decreases prostate cancer mortality
- PSA test has limitations and has to be interpreted appropriately to avoid unnecessary biopsies and overdiagnosis
- Research is ongoing to identify a biomarker that helps identify patients at risk of dying from the disease
- Treatment options for prostate cancer has to be tailored to the patient considering comorbidities, life expectancy and patient preferences
- Minimally invasive surgery decreases the morbidity of surgery



Questions?

