1-1. Anatomy and Physiology of Prostate gland

The Prostate, which is part of the male reproductive system, is an exocrine gland that encloses the male urethra and its base is located at the bladder neck. A thin layer of connective tissue separates the prostate and seminal vesicles from the rectum posteriorly. There are three distinct zones found in the prostate gland. These are (a) the peripheral zone, (b) the transitional zone and (c) the central zone.² The peripheral zone, which is approximately 70% of the prostate, is the most common origin of carcinoma, chronic prostatitis, and post inflammatory atrophy.¹ The central zone covers 25% of the prostate gland. It is cone-shaped and is located at the base of the prostate adjacent to the seminal vesicles. The central zone also contains approximately 1/3 of the ducts that secrete fluid that helps create semen. The transition zone makes up 5% volume of the gland and surrounds the urethra. The prostate gland is enclosed by a fibrous tissue layer and is named as the prostate capsule. Commonly, this capsule is the distinction when a prostate cancer spreads out of the gland and into surrounding tissues and organs.

The primary function of the prostate gland, which is regulated by testosterone, is to secrete a fluid that is added together with the spermatozoa from the seminal vesicles to constitute majority of semen. This secretion is known to facilitate sperm motility and survival by providing a protective and fluid medium for their passage through the vagina for fertilization. Without this helpful fluid, sperm cells may inefficiently reach the egg, because this
fluid prolongs the lifespan of the sperm by being weakly alkaline to neutralize the mildly acidic environment in the vaginal tract.

1-2. Development of Prostate Cancer

Prostate carcinoma begins when prostate gland cells multiply and grow out of normal control. It usually begins in the peripheral zone where some clusters of cells are confined within the prostate gland. If this condition progresses, the uncontrolled cells will form a tumor and may invade the stroma as well as extend to the seminal vesicle. If the tumor breaches the capsule, it can now spread more widely and invade the lymphatic system, travelling to regional lymph nodes and then to other organs. This phenomenon is known as metastasis.

Prostate Cancer may develop into two kinds, Androgen dependent and Androgen Independent Prostate Cancer. Androgen dependent prostate cancer, which depends on androgens for cell growth, is often found at the earlier stage of Prostate cancer and may be controlled by treatment of Androgen deprivation therapy. Androgen independent prostate cancer, which do not depend on androgen for growth, is completely unaffected by Androgen deprivation therapy and has the most incidence of mortality in prostate cancer.

1-2-1. Epidemiology of Prostate Cancer

Prostate cancer is known to be the most common malignancy in
men and the second leading cause of cancer mortalities of men. Although prostate cancer is least common among Asian men and most common among black men, these high rates are still affected by the increasing rates of detection. Adenocarcinoma is responsible for 95% of prostatic neoplasms, despite the usual lack of specific presenting symptoms. This cancer usually develops in men over the age of fifty. In countries such as United States and United Kingdom, there are recorded cases of about 186,000 and 35,000 cases for each year respectively. And there are about 15-30% cases of mortality among those diagnosed with prostate cancer.