Total Joint Replacement in Octogenarians Dilemma & Challenges

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Aging Population in Hong Kong

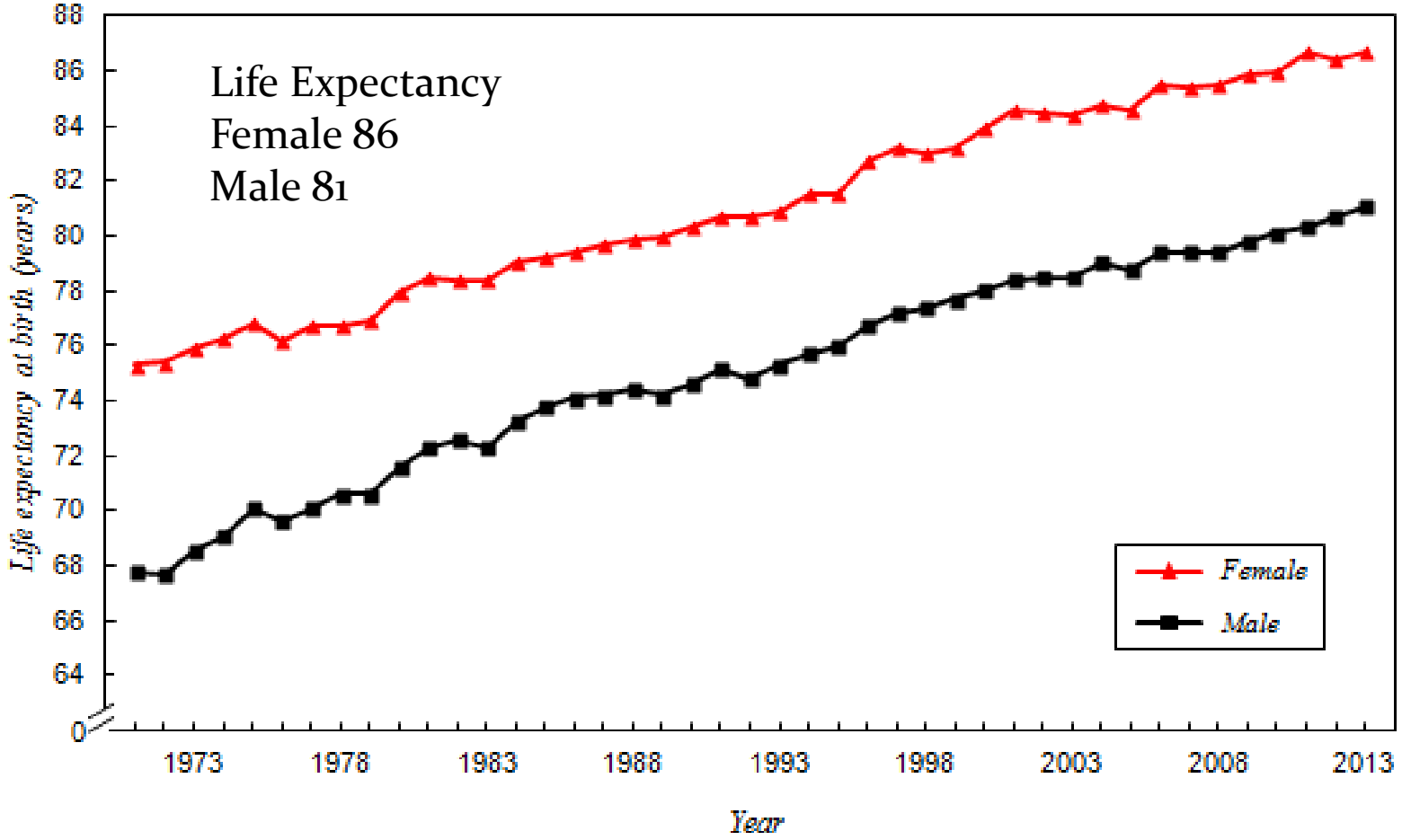


Figure from Census and Statistics Department, HKSAR

Future Population in Hong Kong

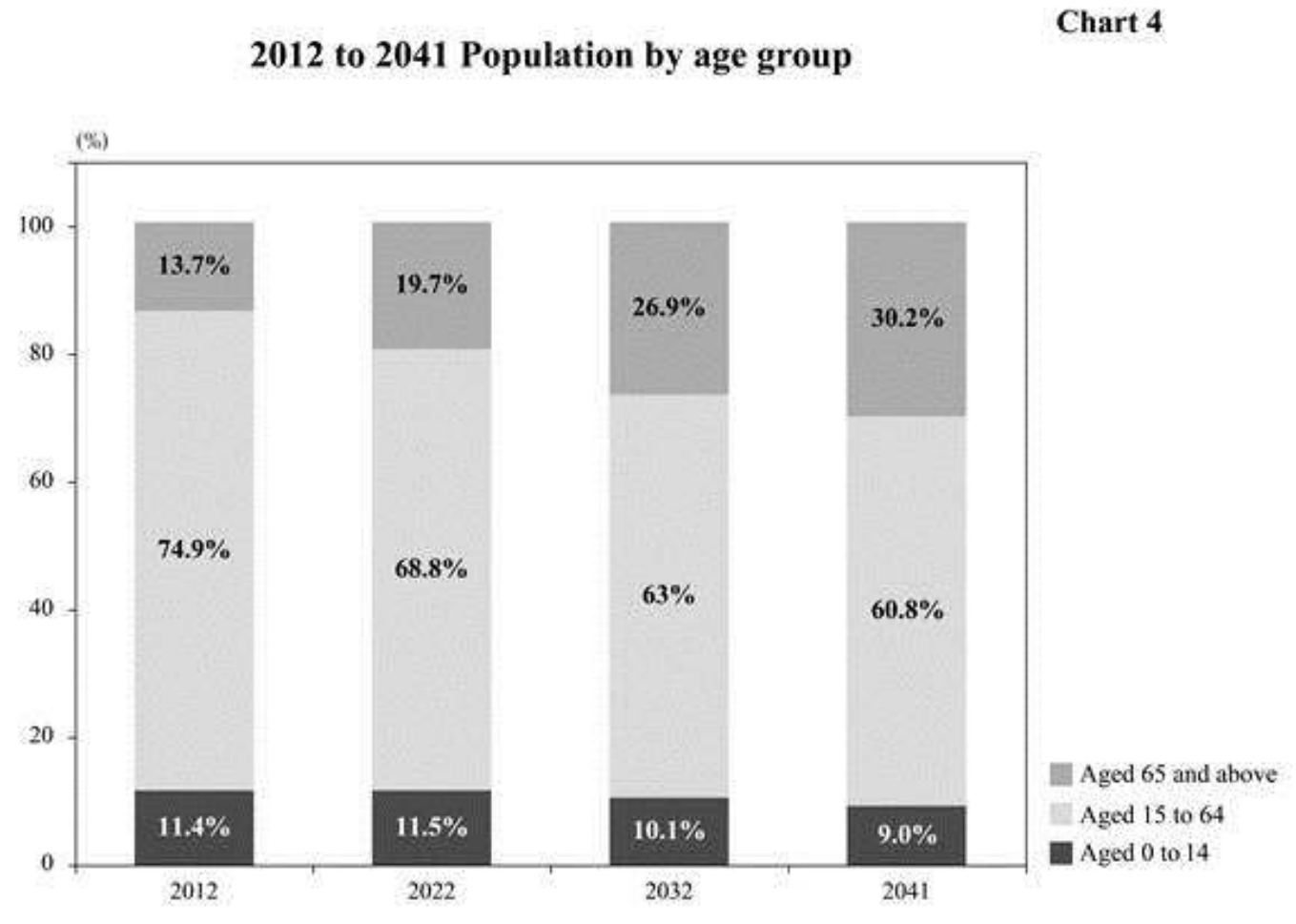
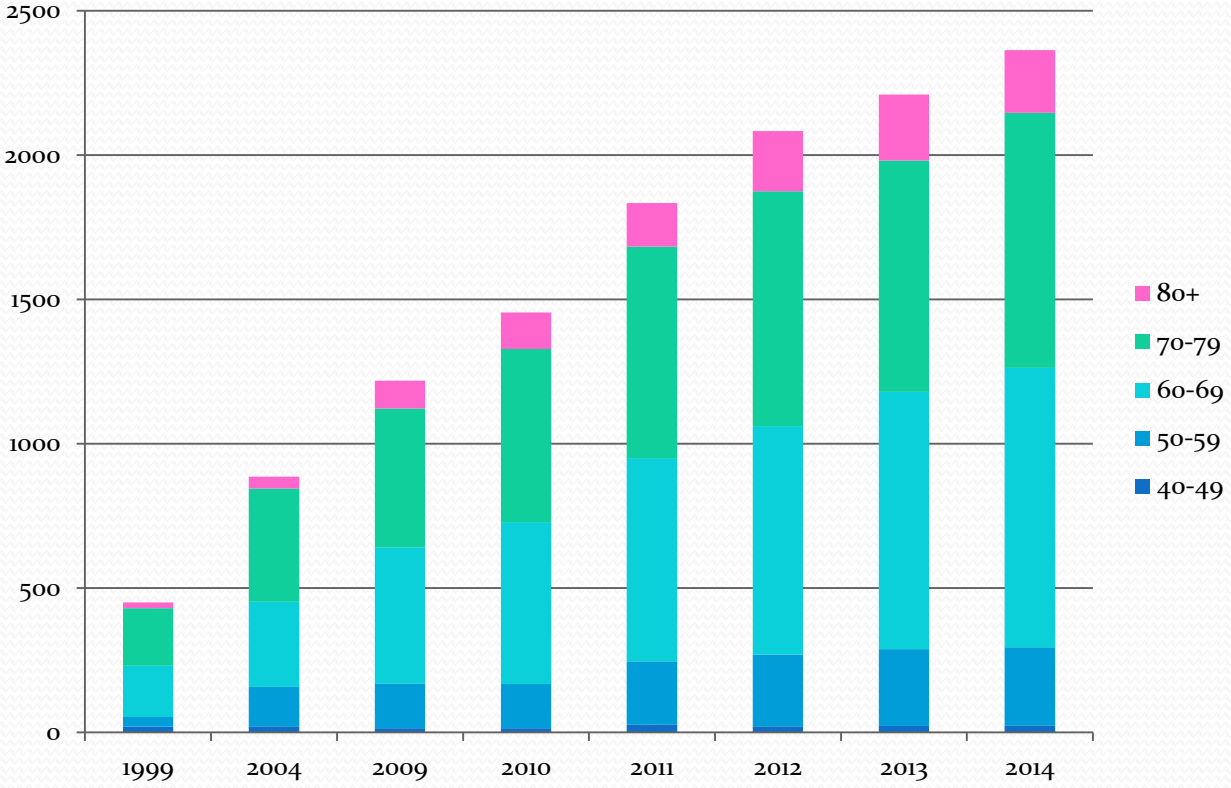


Figure from The Budget 2013-2014, HKSAR

Total Knee Replacement in Octogenarians in HA Hospitals

- How large is the problem?



Data from CDARS 1999 - 2014

Dilemma

- How old is “too old for surgery”?



- How ill is “too ill for surgery”?

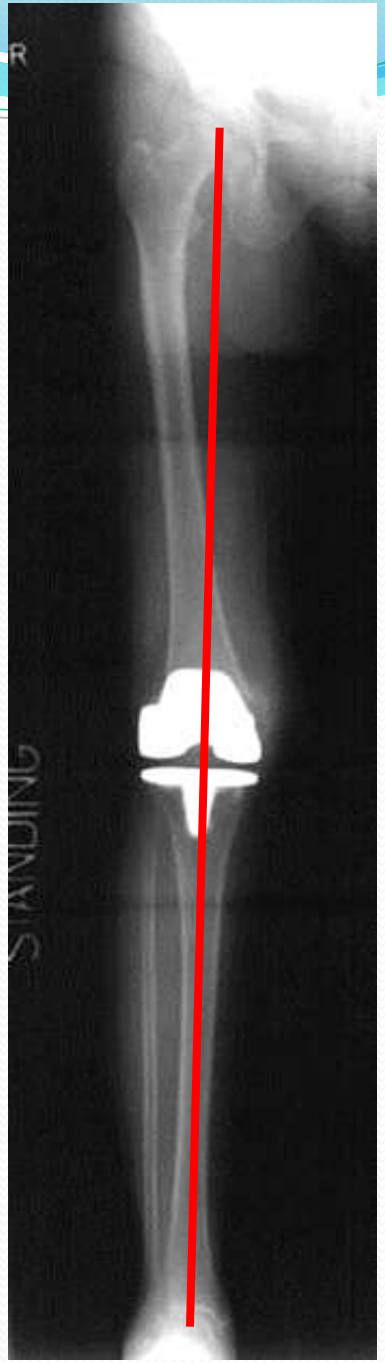
Indications of Total Knee Replacement

- Advanced osteoarthritis of knees
- Failed conservative treatments
- No active infection

- **Age is not a contra-indication!!**

- **Aim of Surgery**
  - **Pain free**
  - **Mobile**
  - **Stable knee joint**


R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STANDING

Characteristics of Octogenarians

- Complexity of medical problems
  - Hypertension
  - Diabetes mellitus
  - Hyperlipidaemia
  - Osteoporosis
  - Benign prostatic hypertrophy
  - Ischaemic heart disease
  - Stroke
  - Dementia
- Social problems
  - Living environment
  - Carer

Problems of TKR in Octogenarians

- Higher mortality rate
- Higher complication rate
- Slower in rehabilitation
- Longer length of stay

Clement ND et al. J Bone Joint Surg Br 2011;93:1265.
Hilton et al. Orthopedics 2004;27:37.
Joshi AB, Markovic L, Gill G. J Arthroplasty 2003; 18:295.
Brander VA et al. Clin Orthop Relat Res 1997;67.
Tankersley WS, Hungerford DS. Clin Orthop Relat Res 1995;45.
Levy RN et al. Clin Orthop Relat Res 1995;25.
Hosick WB, Lotke PA, Baldwin A. Clin Orthop Relat Res 1994;77.
Zicat B, Rorabeck CH, Bourne RB, et al. J Arthroplasty 1993; 8:395.

Perioperative Mortality

- 30-day mortality
  - <80 0.1%
  - 80-89 0.4%
  - 90+ 1.4%

Miric A et al. J Arthroplasty 2014

- Causes of mortality
  - Cardiovascular
  - Pulmonary embolism

Thromboembolism after TKR

- Incidence of pulmonary embolism after TKR
  - 0.4%
- Preventive measures:
  - **Early mobilisation**
  - **Pharmacological prophylaxis**
  - **Mechanical prophylaxis**
- Routine doppler USG after TKR not recommended by national guideline
- **Early detection** by clinical symptoms, signs & confirmed with imagings

Prevention of VTE
Pharmacological Prophylaxis

- Options of drugs
  - Aspirin
  - Warfarin
  - Unfractionated heparin
  - Low molecular weight heparin
  - Factor Xa inhibitor
  - Direct thrombin inhibitor

- Cons
  - Risk of bleeding

Prevention of VTE
Mechanical Prophylaxis

- Pros
  - No significant risk related to the mechanical prophylaxis

- Cons
  - Not as effective as pharmacological agents
  - Cost

Complications of TKR

- Wound infection
- Nerve injury
- Vascular injury
- Fracture
- Extensor mechanism disruption
- Patella mal-tracking
- Loosening & wear

Surgical Site Infection

- Incidence of SSI after TKR
  - 1%
- Risk Factors:
  - Rheumatoid arthritis
  - Diabetes Mellitus
  - Prior surgery
  - Revision total joint replacement

Surgical Site Infection

- Measures to reduce SSI:
  - Prophylactic antibiotics
    - Broad spectrum covering Gram + organisms
    - MRSA carrier – selective use of Vancomycin
  - Laminar air flow operating theatre
  - Exhaust body system
    - Contradictory results
- Additive measures:
  - Antibiotics cement
  - Use of transexamic acid (TXA)

The Surveillance of Surgical Site Infection after Primary Total Knee Replacement from 1993 to 2013

Division of Joint Replacement Surgery

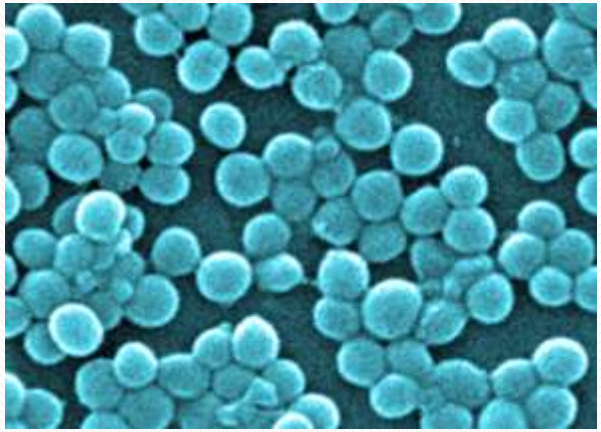
FY NG, KY CHIU, CH YAN, PK CHAN

Risk Factors in Primary TKR

	Risk Ratio	P value
Age <70 >70	 1 1.36	0.48
Sex Female **Male**	 1 2.59	0.03*
Diabetes Mellitus No Yes	 1 1.4	0.05*
Rheumatoid Arthritis No Yes	 1 2.4	0.01*
Previous Surgery No Yes	 1 2.59	0.22
One Stage Bilateral TKR Yes No	 1 1.25	0.59

Emerging evidence of MRSA carriers in Hong Kong

- 2005 - 2.8 -5.1% MRSA carriers in long term care facilities
- 2011 – increased to 21.6%



VCC Cheng et al. Transmission of MRSA in the long term care facilities in Hong Kong.

BMC Infectious Diseases 2013

Emerging evidence of infection control

- Pre-operative MRSA screening
  - MRSA carriers prevalent in institutionalised patients
  - Decolonisation protocol
  - Vancomycin as prophylactic antibiotics in selected cases

- Antibiotics cement in high risk patients
  - Rheumatoid arthritis
  - Revision total joint replacement
  - Immunosuppressive agents

Transexamic Acid in TKR

- Either given intravenously or intra-articularly

- Significantly reduce postoperative bleeding and drain output
- Significantly reduce post-operative transfusion
- Potentially reduce wound haematoma and infection

Slower Rehabilitation

- Muscle power improvement
- Proprioception training
- ↑Length of stay

Husted H et al. Acta Orthop 2008;79:168–173.

Jørgensen CC, Kehlet H. Br J Anaesth2013;110:972–980.

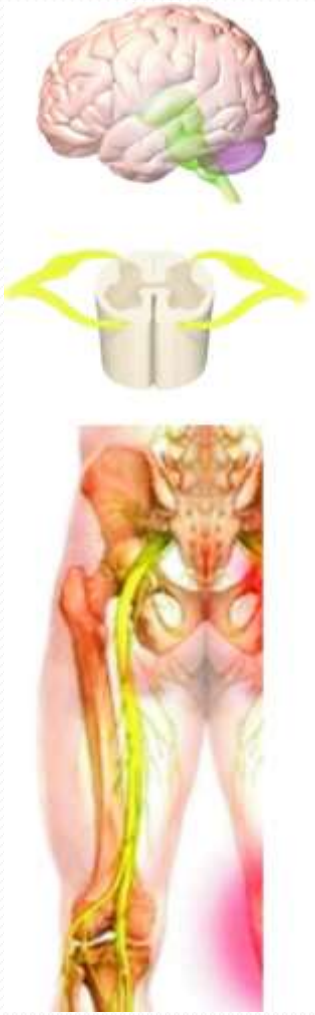
Rissanen P et al. Int J Technol Assess Health Care 1996;12:325–335.

Forrest G et al. J Arthroplasty 1998;13:186–190.

Postoperative Pain Control

- Conventional pain control
  - Oral opioid
  - Intramuscular/ intravenous opioid

- Contemporary pain control
  - Avoid use of opioid
  - Multimodal approach
  - **Pre-emptive analgesics**
  - **Intra-articular cocktail injection**
  - Peripheral nerve block

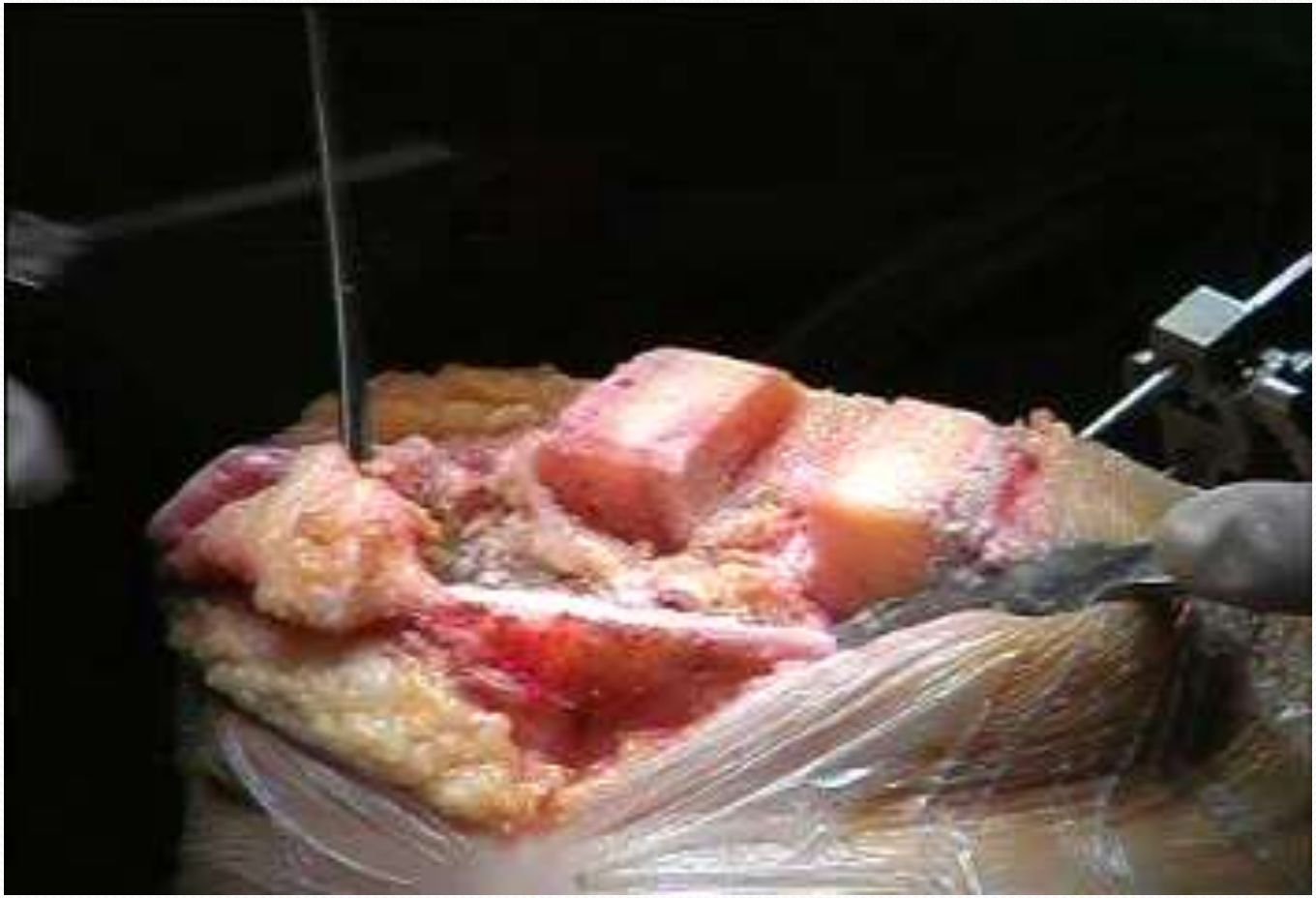


Pre-emptive analgesics

- Principles:
  - **Introduction of an analgesic regimen before the onset of noxious stimuli, with the goal of preventing sensitization of the nervous system to subsequent stimuli that could amplify pain.**

- Agents:
  - Cox-II agents
  - Neuropathic agents

Cocktail (Periarticular) Injection



Multimodal Periarticular Injection Vs Continuous Femoral Nerve Block After Total Knee Arthroplasty

A Prospective, Crossover, Randomized Clinical Trial

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Kwong-Yuen Chiu, MBBS, FRCSE (Ortho), FHKAM (Ortho Surg),*
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Chi-Wing Chan, MBBS, FHKCA, FHKAM (Anaes)†

- Efficacy of cocktail injection similar to continuous femoral nerve block
- Technically more simple for cocktail injection
- Cost is lower in cocktail injection

FY Ng et al. J Arthroplasty 2012

Fast-track Rehabilitation after TKR

- Structured protocol
- Multidisciplinary approach
- Effective pain control
- Efficient surgical team
- Early rehabilitation

Kehlet H, Wilmore DW. Am J Surg 2002; 183:630-641

Husted H, Jensen CM, Solgaard S, et al. Arch Orthop Trauma Surg 2012; 132:101-104

Jorgensen CC et al. Br J Anaesth 2013; 110:972-980

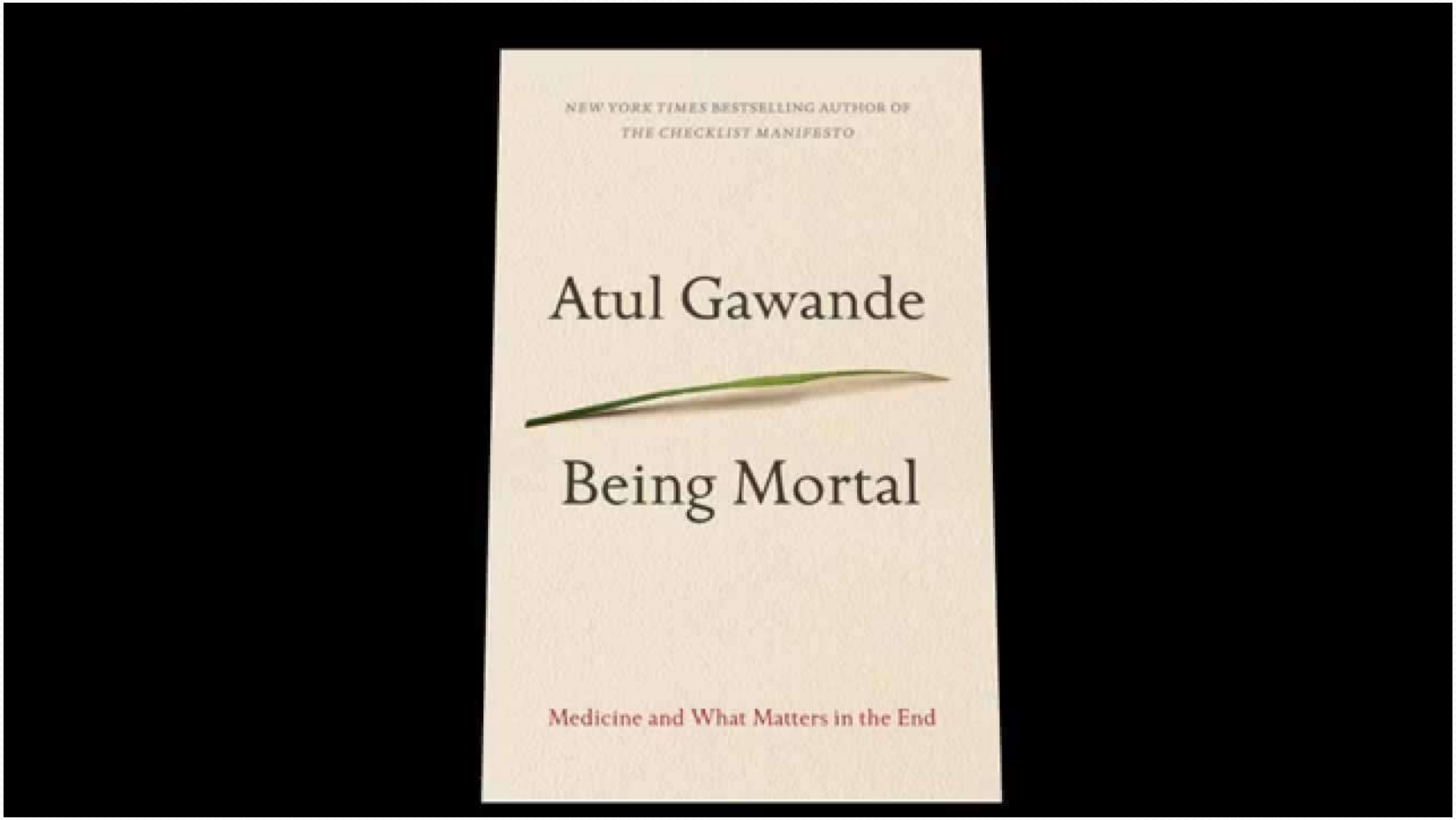
F/ 86 Four hour after Left TKR

Team Work

Conclusion

- TKR is a viable option for advanced OA knees in octogenarian
- With careful selection of patients, TKR can be safely performed
- Perioperative pain control is essential for early rehabilitation
- Fast track rehabilitation is possible in selected patients

A Book – Being Mortal



Thank You