وزارة الصحة
Ministry of Health

The Saudi Center for
Evidence Based Health Care

Evidence Based Clinical Recommendations

National Guidelines from the Saudi Center for Evidence Based Health Care, 2015

Table of Contents

Foreword from the Saudi Centre for Evidence Based Health care (EBHC)

The Saudi Centre for Evidence Based Health Care has managed and supported the co-ordination of the process of clinical practice guideline (CPG) development between the methodological team from McMaster University and the local clinical expert panel members in Saudi Arabia.

The EBHC staff members recruited local clinical experts through contacting Saudi specialist societies and also independent experts interested in developing reliable and most up-to-date CPGs to standardise the treatment and provide the highest quality of health care in Saudi Arabia. These experts were health care professionals from multidisciplinary backgrounds. As much as possible, patient's representatives were also included in panels.

In an effort to make national recommendations, the participating experts were professionals from the Ministry of Health (MoH), National Guard Hospitals, King Faisal Specialist Hospital and Research Centre (KFSHRC), University Hospitals, Security Forces Hospitals, Prince Sultan Military Medical City (PSMMC) and from some private hospitals.

The EBHC provided a list of potential topics to be addressed in CPGs after thorough consultations with the local stakeholders. These topics were further discussed with the McMaster team for searching for the best available CPGs according to selection criteria (guidelines scoring high on AGREE II instrument, availability of transparent evidence summaries that can be updated, and the CPGs are current).

The guideline panel meetings were held in Riyadh on 2nd-5th Dec 2013 for the wave 1 and between 15th-18th March 2015 for wave 2 where in total about 200 local experts working in Saudi Arabia participated with the methodological support from McMaster University and its

partners from the American University of Beirut, Lebanon, and the University of Freiburg, Germany, in providing high quality recommendations for common and important clinical conditions in the Saudi Arabia.

The Saudi Centre for EBHC has supported the efforts for dissemination of the CPGs by publishing online the full reports of the CPGs, facilitates writing concise versions of the CPGs for publication in peer reviewed medical journals, sending hard copies main hospitals and health care centres.
Finally, we have introduced themobile App to facilitate the dissemination efforts and to make
a friendly access to these recommendations by our health care professionals.

If you would like to access the full CPGs, the Handbook for Healthcare Guideline Development
Or if you would like to download the EBHC Mobile App, here are the links:

http://www.moh.gov.sa/endepts/Proofs/Pages/GuidelineAdaptation.aspx
http://www.moh.gov.sa/depts/Proofs/Announcements/Pages/Ads-2015-02-18-001.aspx

Zulfa Al Rayess, Consultant Family Medicine, Head of Saudi Center for EBHC
Yaser Adi, Scientific Advisor for the Saudi Centre for EBHC
Nourah Al Moufarreh, Project Manager, Saudi Center for EBHC

Saudi experts participated in developing the CPGs recommendations

1. Use of Screening Strategies for detection of Breast Cancer
   - Dr. Omalkhair Abualkhair
   - Dr. Fatina Tahan
   - Dr. Ahmed Saadeddin
   - Dr. Iman Baroum
   - Dr. Bandar Alharthy

2. Management of Breast Lump and Primary Breast Cancer
   - Dr. Omalkhair Abulkhair
   - Dr. Meteb Al Foheidi
   - Dr. Bandar Al Harthi
   - Dr. Sami Al Ruhaily
   - Dr. Abdulaziz Al Saif
   - Dr. Mona Al Shahed
   - Dr. Noha Dashash
   - Dr. Ahmed Saadeddin
   - Dr. Fatma Al Abadi (Patient Representative)

3. Screening and Treatment of Precancerous Lesions for Cervical Cancer Prevention
   - Dr.Emad Sagr
   - Prof. Khalid Sait
   - Dr. Hazem Al Mandeel
   - Dr. Hany Salem
   - Dr. Hassan Latifah
   - Dr. Abdulmehsen Alkushi
   - Ms. Nada Masoudi

4. Screening for Colorectal Cancer
   - Dr. Nasser Al-Sanea
   - Dr. Alaa Salah Omar Abduljabbar
   - Dr. Samar AlHomoud
   - Dr. Majid Abdulrahman Almadi
   - Dr. Taghreed A. Al Shaban
   - Dr. Abdullah Alsuhaibani
   - Dr. Ahmad Alzahrani
   - Dr. Faisal Batwa
   - Dr. Abdul-Hameed Hassan
   - Mrs. Denise Hibbert
   - Dr. Randa Nooh

5. Screening for Hypertension
   - Dr. Abdullah Alkhenizan
   - Dr. Ayman Afify
   - Dr. Mohammed Al-Ateeq
   - Dr. Rajaa Al-Raddadi
   - Dr. Saad Albattal
   - Dr. Amro Alomran
   - Dr. Mostafa Alshamiri
   - Dr. Mohammad Kurdi
   - Dr. Ihab Suliman

6. Management of Pre-Eclampsia
   - Dr. Areej Khalid Mahrous
   - Dr. Emad Sagr
   - Dr. Elham A. Al Mardawi
   - Dr. Hajer Yousef Almudaiheem
   - Dr. Maha Ismail Tulbah
   - Dr. Nadia Ali AlGhilan
   - Dr. Reem Saad Alkhnbashi

7. Management of Eclampsia
   - Dr. Areej Khalid Mahrous
   - Dr. Emad Sagr
   - Dr. Elham A. Al Mardawi
   - Dr. Hajer Yousef Almudaiheem
   - Dr. Maha Ismail Tulbah
   - Dr. Nadia Ali AlGhilan
   - Dr. Reem Saad Alkhnbashi

8. Migraine Headache: Diagnosis & Treatment
   - Dr. Adel Al-Hazzani
   - Dr. Nasser Alotaibi
   - Dr. Suleman Kojan
   - Dr. Manal Murad
   - Dr. Mona Talab Obaid

9. Management of of Overweight and Obese Adults
   - Dr. Assim A. Alfadda
   - Ms. Madawi M. Al-Dhwayan
   - Dr. Abdulhameed Alharbi
   - Dr. Basma Alkhudhair
   - Dr. Omar M. Al Nozha
   - Dr. Nawal Al-Qahtani
   - Dr. Saad A. Alzahrani
   - Dr. Wedad Bardisi
   - Dr. Reem M. Sallam

10. Management of Sickle Cell Disease
    - Dr. Ahmad Taraweh
    - Dr. Muneer H. Albagshi
    - Dr. Ali Abdulali Aljishi
    - Dr. Khaled Jassem Alsalman
    - Dr. Saud Mohamed Abu-Harbesh
    - Dr. Mohammed Bashir
    - Dr. Hafiz Malhan

11. Management of Thalassemia: Iron chelation, Bisphosphonates and Zink supplementation

Prof. Abdulkareem Almomen
Prof. Soad Al-Jaouni
Dr. Abdullah Al-Jefri
Dr. Mustafa Al Kalaf
Dr. Fawaz Abdulaziz Al-Kasim
Dr. Hussein Al-Saeed
Dr. Ahmed Al-Suliman
Dr. Fahad Al Tamimi
Dr. Azzah Al-Zahrani

12. Diagnosis of Suspected First Deep Vein Thrombosis of Lowe Extremity

Dr.Fahad Al Hameed
Dr.Tarig AlKhuwaitir
Dr. Hasan Al Dorzi
Dr. Essam Aboelnazar
Dr. Ebtisam Bakhsh
Dr. Mohamad Abdelaal
Dr. Abdulrahman Shamy
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13. Treatment of Venous Thromboembolism

Dr.Abdulkarim AlMomen
Dr.Khalid Alsaleh
Dr.Frajah H.AlGahtani
Dr. Hazzaa Al Zahrani
Dr. Mohammed AlSheef
Dr. Tareq Owaidah

14. Prophylaxis of Venous Thromboembolism in Medical Patients and Long Distance Travelers

Dr. Fahad Al-Hameed
Dr. Ali Alaklabi
Dr. Hasan Al-Dorzi
Dr. Mohamed A. Abdelaal
Dr. Ebtisam Bakhsh
Dr. Salah Aldahan
Dr. Mohammad Al Baik
Dr. Yousef Alomi

15. Prevention of Venous Thromboembolism in General Abdominal-Pelvic Surgery and Major Orthopedic Surgery

Dr. Hasan Al Dorzi
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Dr. Ali Alaklabi
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Prof. Fawzi Al Jassir
Dr. Tarig Al Khuwaitir
Dr. Saleh Alqarni

16. Management of ST-Elevation Myocardial Infarction

Dr. Adel Tash
Dr. Amr Bannan
Dr. Hamed Alghamdi
Dr. Faisal Al Samadi
Dr. Zohair Al Aseri
Dr. Owayed Al Shammeri

17. Antithrombotic Treatment of Patients with Non-Valvular Atrial Fibrillation

Dr. Ahmad Hersi
Dr. Abdulmohsin Almusaad
Dr. Ihab Suliman
Dr. Fayez Bokhari
Dr. Bandar Alghamdi
Dr. Ahmad Alfagih
Dr. Ghadah Bawazeer
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18. Use of Thrombolytic Therapy in Acute Stroke

Dr. Ali Al Khathaami
Dr. Fahmi Al-Senani
Dr. Adel Al-Hazzani
Dr. Omer Ayoub
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19. Prevention of Venous Thromboembolism in Patients with Stroke

Dr. Ali Al Khathaami
Dr. Adel Al-Hazzani
Dr. Fahmi Al-Senani
Dr. Omer Ayoub
Dr. Fawaz Al Hussain

20. Allergic Rhinitis in Asthma

Dr. Hassan Al-Rayes
Dr. Sulaiman Al Gazlan
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21. Timing of Initiation of Hemodialysis

Dr.Khaled Al Hasan
Dr.Abdulkarim Alenazi
Dr.Ahmed Mutawalli
Dr.Mohammed Alhomrani
Dr.Adnan Alfi
Dr.Bader Alhomayeed

22. Role of vitamin D, Calcium and Exercise in Fracture Prevention in Elderly

Prof. Riad Sulimani
Dr. Salwa Al Aidarous
Dr. Mohammad Al Shaker
Dr. Hanan Al Rayes
Dr. Mona Fouda
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Prof. Mir Sadat
Dr. Nada Abu-Shraie

Interpretation of strong and conditional (weak) recommendations in GRADE

Implications	Strong recommendation	Conditional (weak) recommendation
For patients	Most individuals in this situation would want the recommended course of action and only a small proportion would not. Formal decision aids are not likely to be needed to help individuals make decisions consistent with their values and preferences.	The majority of individuals in this situation would want the suggested course of action, but many would not.
For clinicians	Most individuals should receive the intervention. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator.	Recognize that different choices will be appropriate for individual patients and that you must help each patient arrive at a management decision consistent with his or her values and preferences. Decision aids may be useful helping individuals making decisions consistent with their values and preferences.
For policy makers	The recommendation can be adapted as policy in most situations	Policy making will require substantial debate and involvement of various stakeholders.

GRADE's Quality of the Evidence

- *High*: We are very confident that the true effect lies close to that of the estimate of the effect.
- *Moderate*: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
- *Low*: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.
- *Very low*: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

1. Use of Screening Strategies for Detection ofBreast Cancer

Recommendation 1:

The Panel suggests screening with mammography in women aged 40–49 years every 1 to 2 years. (Conditional recommendation; low-quality evidence)

Remarks:
Based on local cancer registry data, the incidence of breast cancer in the KSA seems to be higher than in the other countries in which studies were conducted. This fact may indicate that higher benefit on breast cancer mortality justifies a recommendation in favor of implementing breast cancer screening using mammography in this age group. Since the guideline panel determined that there is a close balance between desirable and undesirable consequences, they also suggest implementing shared-decision making strategies as a way to incorporate actively patients' perspective into the decision.

Recommendation 2:

The Panel suggests screening with mammography in women aged 50–69 years every 2 years (Conditional recommendation; moderate-quality evidence).

Remarks:
Based on local cancer registry data, the incidence of breast cancer in the KSA for this age group is similar to the ones reported in the literature in other countries. The guideline panel determined that desirable consequences probably outweigh undesirable consequences in most settings.

Recommendation 3:

The Panel suggests no screening with mammography in women aged 70–74 years (Conditional recommendation; low-quality evidence)

Remarks:
Giving the competing risks with other diseases, screening with mammography seems to be not a priority for this age group. Based on local cancer registry data, the incidence of breast cancer in the KSA for this age group is similar to the ones reported in the literature in other countries. The guideline panel determined that undesirable consequences probably outweigh desirable consequences in most settings. In case this option is offered to women between 70 to 74 years old, the panel proposed that this should be done every 2 to 3 years.

Recommendation 4:

The Panel suggests that self-breast examination not be used as a single method of screening for breast cancer in women of all ages. (Conditional recommendation; very-low quality evidence)

Remarks:
The panel determined that the strength of the recommendation should be weak/conditional based on the extensive level of uncertainty and lack of evidence. The guideline panel also highlighted that, when mammography is available, this option should always be offered first to patients. In this regard, breast self-examination plays a secondary role, especially in regions where mammography may not be offered.

Recommendation 5:

The Panel suggests that clinical breast examination by a health care professional not be used as a single method of screening for breast cancer in women of all ages. (Conditional recommendation; no evidence).

Remarks:
The panel determined that the strength of the recommendation should be weak/conditional based on the extensive level of uncertainty and lack of evidence. The guideline panel also highlighted that when mammography is available, this option should always be offered first to patients. Clinical breast examination could be used as method for breast cancer screening only when mammography is unavailable. This recommendation does not relate to routine physical examination. The option described in this recommendation covers only clinical breast examination in the context of breast cancer screening.

2. Management of breast lump and primary breast cancer

Recommendation 1:

In women 30 to 40 years, the panel recommends ultrasonography over mammography as part of the triple assessment of palpable breast masses. (strong recommendation, very low quality evidence)

Recommendation 2:

In patients with invasive breast cancer who are undergoing breast surgery, the panel suggests breast-conserving therapy over mastectomy. (conditional recommendation, moderate quality evidence)

Remarks:

- Patients need to be adequately informed about the impact of each intervention in their particular situation.
- It is necessary to make an informed decision in different subgroups of patients:
    - Patients in different age spectrums may be treated with the alternative option due to their values and preferences.
    - Patients from regions in non-central areas may be treated with the alternative option due to feasibility concerns.
    - Non-Saudi women who need to pay for the treatment may choose the alternative option due to possible differences in cost.

Recommendation 3:

In patients with invasive breast cancer undergoing conservation surgery, the panel recommends achieving clear radial margins (defined as no cancer cells on inked margins). (strong recommendation, low quality evidence) Remarks: No specific recommendation could be made regarding the optimal extent of margin clearance.

Recommendation 4:

In patients with ductal carcinoma in situ (DCIS) undergoing conservation surgery, the panel recommends achieving clear radial margins (defined as no DCIS at inked margins). (strong recommendation, moderate quality evidence) Remarks: No specific recommendation could be made regarding the optimal extent of margin clearance.

Recommendation 5:

In patients with early breast cancer and clinically negative axilla undergoing breast surgery irrespective of the type, mastectomy or BCS, the panel recommends sentinel Lymph node biopsy (SLNB) over Axillary lymph Node Dissection (ALND). (strong recommendation, low quality evidence)

Recommendation 6:

In patients with invasive breast cancer undergoing breast conservation surgery, the panel suggests not using Accelerated Partial breast Irradiation (APBI). (conditional recommendation, very low quality evidence)

In patients with invasive breast cancer undergoing breast conservation surgery, the panel suggests using Whole Breast irradiation (WBI) over Accelerated Partial breast Irradiation (APBI). (conditional recommendation, very low quality evidence)

Recommendation 7:

In women with early breast cancer, the panel recommends neoadjuvant or preoperative chemotherapy as the first line option over adjuvant chemotherapy. (strong recommendation, moderate quality evidence)

Remarks:

- Patients with very small tumours who would not benefit from a tumour reduction can directly go into surgery.
- Patients with luminal A-like tumour type can directly go into surgery because survival differences of patients with or without a pathological complete response (pCR) are expected to be less pronounced in luminal A-like tumours.

Recommendation 8:

In patients with early breast cancer, the panel suggests the use of either option of anthracycline based standard adjuvant chemotherapy or no anthracycline chemotherapy (CMF-cyclophosphamide methotrexate and fluorouracil). (conditional recommendation, moderate quality evidence)

Remarks:

- Patients with history of cardiac disease or cardiovascular risk factors should be treated with non-anthracycline based chemotherapy.

Recommendation 9:

In women with HER-2 positive breast cancer,the panel recommends neoadjuvant trastuzumab given following or in combination with standard chemotherapy. (strong recommendation; moderate quality evidence)

Remarks:

- The cardiac function of patients receiving neoadjuvant trastuzumab should be monitored in order to identify any potential cardiovascular adverse effects.

Recommendation 10:

In postmenopausal women with early invasive breast cancer, the panel recommends the use of adjuvant aromatase inhibitors over adjuvant tamoxifen. (strong recommendation; moderate quality evidence)

Remarks:

- Baseline bone density definition must be done before starting treatment with adjuvant aromatase inhibitors.
- The need for Vitamin D and calcium supplementation should be assessed during the treatment of patients with adjuvant aromatase inhibitors.
- Considerations of comorbidities must be made:
    - Patients with osteoporosis should be treated with tamoxifen due to the risk of bone tissue loss with AI.
    - High risk cardiovascular disease patients should be treated with tamoxifen due to the cardiotoxicity risk of AI.
    - Patients intolerant to adjuvant AI should be treated with tamoxifen.

Recommendation 11:

In elderly patients with operable primary breast cancer, the panel does not recommend one intervention over the other (surgery or primary endocrine therapy). The decision should be guided by the suitability of patients for surgery and their values and preferences (low quality evidence).

Remarks:

- Primary endocrine therapy may be suitable for elderly patients presenting very advanced cancer stage or contraindications for surgery.
- Baseline bone density definition must be done before starting treatment with neoadjuvant aromatase inhibitors.
- The need of Vitamin D and calcium supplementation should be assessed during the treatment of patients with adjuvant aromatase inhibitors.
- Considerations of comorbidities must be made:
    - Patients with osteoporosis should be treated with tamoxifen due to the risk of bone tissue loss with AI.
    - High risk cardiovascular disease patients should be treated with tamoxifen due to the cardiotoxicity risk of AI.
    - Patients intolerant to adjuvant AI should be treated with tamoxifen.

Recommendation 12:

In postmenopausal women with hormone-receptor positive breast cancer, the panel suggests neoadjuvant aromatase inhibitors over tamoxifen. (conditional recommendation, moderate quality evidence)

Remarks:

- Baseline bone density definition must be done before starting treatment with adjuvant aromatase inhibitors.
- The need of Vitamin D and calcium supplementation should be assessed during the treatment of patients with adjuvant aromatase inhibitors.
- The duration of the neoadjuvant endocrine treatment should not exceed 6 months.
- The cardiac function of patients receiving neoadjuvant AI should be monitored in order to identify any potential cardiovascular adverse effects.
- Considerations of comorbidities must be made:
    - Patients with osteoporosis should be treated with tamoxifen due to the risk of bone tissue loss with AI.
    - High risk cardiovascular disease patients should be treated with tamoxifen due to the cardiotoxicity risk of AI.
    - Patients intolerant to AI should be treated with tamoxifen.

3. Screening and Treatment of Precancerous Lesions for Cervical Cancer Prevention

Recommendation 1:

The Panel recommends to use HPV test followed by colposcopy over VIA followed by colposcopy to screen for CIN2+ in women at risk of cervical cancer. (strong recommendation, moderate quality evidence for diagnostic test accuracy and very low quality evidence for health outcomes evidence)

Remark:
In settings where colposcopy is not available, cytology is an alternative for women who tested positive in the HPV test (evidence not assessed).

Recommendation 2:

The Panel suggests to use HPV test followed by colposcopy over cytology followed by colposcopy to screen for CIN2+ in women at risk of cervical cancer. (conditional recommendation, low quality evidence for diagnostic test accuracy and very low quality evidence for health outcomes evidence)
Remark:
In settings where colposcopy is not available, cytology is an alternative for women who tested positive in the HPV test (evidence not assessed).

Recommendation 3:

The Panel suggests to use cytology followed by colposcopy over VIA followed by colposcopy to screen for CIN2+ in women at risk of cervical cancer. (conditional recommendation, low quality evidence for diagnostic test accuracy and very low quality evidence for health outcomes evidence)

Recommendation 4:

The Panel recommends to use cryotherapy over CKC to treat women at risk of cervical cancer who tested positive for CIN2+. (strong recommendation, very low quality evidence for health outcomes evidence)

Recommendation 5:

The Panel recommends to use LEEP over CKC to treat women at risk of cervical cancer who tested positive for CIN2+ (strong recommendation, very low quality evidence for health outcomes evidence)

Recommendation 6:

The Panel suggests to use cryotherapy over LEEP to treat women at risk of cervical cancer who tested positive for CIN2+. (conditional recommendation, very low quality evidence for health outcomes evidence)

4. Screening for colorectal cancer

Recommendation 1:

The panel recommends using colorectal cancer screening for asymptomatic, average risk persons rather than no screening. (strong recommendation, low quality evidence)

Remarks:

- The panel agreed that they were making the most informed decision despite low quality of evidence and that future research would be unlikely to change this recommendation.

Recommendation 2:

The panel suggests not using colorectal cancer screening for asymptomatic persons at average risk aged 70 years or older. (conditional recommendation, low quality evidence)

Remarks:

- Consider that some individual patients might still benefit from screening (if healthy, lack comorbidities, and predicted survival beyond 10 years at the time of screening)
- Consider additional resources needed for mental health and social support if cancer is identified and surgery or other treatment may not be offered or appropriate

Recommendation 3:

The panel recommends screening colonoscopy rather than no screening for asymptomatic, average risk population. (strong recommendation, low quality evidence)

Remarks:

- Colonoscopy is considered the "gold standard" and there is high confidence in the magnitude of the association, even though that is based on low quality evidence
- Some uncertainty is recognized given the indirect evidence regarding resources, values and preference, health inequalities, and feasibility

Recommendation 4:

The panel recommends using flexible sigmoidoscopy (FS) for colorectal cancer screening rather than no screening for asymptomatic persons at average risk. (strong recommendation, moderate quality evidence)

Remarks:

- This recommendation refers to FS screening every 5 years when combined with annual fecal immunochemical (FIT) testing or every 3 years without annual FIT testing

Recommendation 5:

The panel suggests using colonoscopy rather than CT colonography for diagnosis of asymptomatic, average risk patients. (conditional recommendation, low quality evidence)

Remarks:

- The decision to use colonoscopy instead of CT colonography should be driven by feasibility and availability of the tests, as sometimes the wait for endoscopy services is too long for asymptomatic patient screening
- For patients preferring non-invasive screening may choose to undergo CT colonography initially with the understanding they would still be subjected to the bowel preparation procedure and that CT colonography still has small risks of complications and the risk of radiation exposure

Recommendation 6:

The panel suggests offering flexible sigmoidoscopy rather than guaiac fecal occult blood test (gFOBT) for colorectal cancer screening among asymptomatic, average risk persons in the Kingdom of Saudi Arabia. (conditional recommendation, very low quality evidence)

Remarks:

- gFOBT is a less sensitive method, but depending on the availability of other screening modalities, setting, and resources it can still be used
- FS is often done in combination with FOBT (FIT) testing to ensure the entire colon is screened

Recommendation 7:

The panel suggests offering colonoscopy rather than flexible sigmoidoscopy for colorectal cancer screening among asymptomatic, average risk persons. (conditional recommendation, low quality evidence)

Remarks:

- FS needs to be done at least twice as often (every 3-to-5 years depending on whether FIT provided annually)
- Consider that FS misses right-sided disease
- Benefit of FS may be more if combined with FOBT or FIT

5. Screening for Hypertension

Recommendation 1:

The panel recommends to screen for hypertension in adults ≥ 55 years old who are going to a physician. (strong recommendation, moderate quality evidence)

Recommendation 2:

The panel recommends to screen for hypertension in adults ≥ 25 and ≤ 54 years old who are going to a physician. (strong recommendation, moderate quality evidence)

Recommendation 3:

The panel recommends to screen for hypertension in adults ≥ 15 and ≤ 24 years old who are going to a physician. (strong recommendation, moderate quality evidence)

Recommendation 4:

The panel suggests to screen for hypertension in patients <15 years old who are going to a physician. (conditional recommendation, very low quality evidence)

Remarks:
This recommendation is applicable mainly to children > 6 years old

Recommendation 5:

The panel recommends to screen for hypertension in patients at high risk of hypertension, who are going to a physician. (strong recommendation, moderate quality evidence)

Recommendation 6:

The panel suggests to use a cut-off point of systolic blood pressure of 140 mm Hg over a higher cut-off point to diagnose hypertension in patients who are screened at a physician's office. (conditional recommendation, very low quality evidence)

Recommendation 7:

The panel suggests to use a cut-off point of diastolic blood pressure of 90 mm Hg over a higher or lower cut-off point to diagnose hypertension in patients who are screened at a physician's office. (conditional recommendation, very low quality evidence)

Recommendation 8:

The panel suggests to use a cut-off point of systolic blood pressure of 120 mm Hg over a cut-off point of 130 mm Hg to rule-out hypertension in patients who are screened at a physician's office. (conditional recommendation, very low quality evidence)

Remarks:
This cut-off point may be particularly useful in patients with other risk factors for hypertension

Recommendation 9:

The panel suggests to use a cut-off point of diastolic blood pressure of 80 mm Hg over a higher cut-off point to rule-out HTN in patients who are screened at a physician's office (conditional recommendation, very low quality evidence)

Recommendation 10:

The panel suggests to use ambulatory blood pressure measurement (ABPM) as an alternative to clinic blood pressure measurement (CBPM) for screening for hypertension in patients who underwent screening and were normotensive (conditional recommendation, very low quality evidence)

Remarks:
ABPM could be used as an alternative to CBPM, not be preferred over CBPM

Recommendation 11:

The panel suggests to use home blood pressure measurement (HBPM) as an alternative to clinic blood pressure measurement (CBPM) for screening for hypertension in patients who underwent screening and were normotensive (conditional recommendation, very low quality evidence)

Remarks:
HBPM could be used as an alternative to CBPM, not be preferred over CBPM

Recommendation 12:

The panel suggests to use an interval of 1 year to re-screen patients who had systolic blood pressure < 140 mm Hg or diastolic blood pressure < 90 mm Hg during the first screening (conditional recommendation, low quality evidence)

Recommendation 13:

The panel suggests to use an interval of 2 year to re-screen patients who had systolic blood pressure < 120 mm Hg or diastolic blood pressure < 80 mm Hg during the first screening (conditional recommendation, low quality evidence)

6. Management of Pre-Eclampsia

Recommendation 1:

The panel suggests not offering home/hospital bed rest for pregnant women with hypertension. (conditional recommendation, low quality evidence)

Remarks:

- Clinicians should explain to women the low quality evidence for small benefits from bed rest and the potential for inequity due to absence from work and that the current health system does not support bed rest at home.

Recommendation 2:

The panel recommends giving at least 1-2 g of elemental calcium daily to pregnant women starting before 20 weeks. (strong recommendation, moderate quality evidence)

Remarks:

- Most women do not meet calcium requirements. Adherence to supplemental calcium may be low, therefore clinicians should educate women about the benefits (such as preventing pre-eclampsia).
- Clinicians can also encourage women to take less than 1-2 g of calcium supplement if not tolerated, as benefits were also found with lower doses.
- Calcium interacts with iron, zinc, magnesium and phosphorus, all of which are important micronutrients needed during pregnancy, which suggests that calcium supplementation should be separated in time during the day from the recommended daily iron+folic acid supplementation, when used.

Recommendation 3:

The panel suggests not providing vitamin D supplements to pregnant women if only to prevent pre-eclampsia and related outcomes. (conditional recommendation, very low quality evidence)

Remarks:

- Vitamin D can be given as a supplement in pregnant women to meet daily requirements.
- There is a potential cost to offering vitamin D and it may not to be available to all women in particular outside the hospital setting, as it is not covered outside hospital setting.

Recommendation 4a:

The panel recommends giving low dose aspirin for pregnant women at high risk for preeclampsia beginning at first trimester. (strong recommendation, moderate quality evidence)

Remarks:

- Recommendations are based on the clinician's assessment of pregnant woman's risk for pre-eclampsia.
- Low dose aspirin is 81-100 mg in the KSA.

Recommendation 4b:

The panel suggests not giving low dose aspirin for pregnant women with no risk factors for pre-eclampsia and no other conditions requiring aspirin therapy. (conditional recommendation, moderate quality evidence)

Remarks:

- Recommendations are based on the clinician's assessment of pregnant woman's risk for pre-eclampsia.

Recommendation 5:

The expert panel suggests not providing steroids for pregnant women with HELLP syndrome who do not require steroid therapy for other conditions (conditional recommendation, very low quality evidence).

Remarks:

- This recommendation does not consider the use of corticosteroids for other indications (such as fetal lung maturation).

Recommendation 6:

The panel suggests not using antihypertensive medications in pregnant women with mild to moderate hypertension. (conditional recommendation, low quality evidence)

Remarks:
This recommendation highlights the need for discussion between the physician and patient about potential benefits to support decisions that are consistent with the pregnant woman's values and preferences.

Recommendation 7:

In women who have severe hypertension who are being treated the panel suggests using any of the following medications: labetalol, nifedipine, methyldopa, or hydralazine. (conditional recommendation, very low quality evidence)

7. Management of Eclampsia

Recommendation 1a:

The panel recommends magnesium sulfate in pregnant women with pre-eclampsia with severe features. (strong recommendation, moderate quality evidence)

Remarks:

- This recommendation is based on doses of 4-6 g loading to start at diagnosis of severe pre-eclampsia that warrants delivery followed by 1-2 g/hour for 24 hours after delivery or after the last seizure.
- Intravenous versus intramuscular delivery is likely preferred by patients.
- Pre-eclampsia with severe features is clearly identified in the introduction of the guideline document.

Recommendation 1b:

The panel suggests to not provide magnesium sulphate in pregnant women with pre-eclampsia without severe features. (conditional recommendation, moderate quality evidence)

Remarks:

- Pre-eclampsia with severe features is clearly identified in the introduction of the guideline document.

Recommendation 2:

The panel recommends magnesium sulfate over phenytoin for the prevention of eclampsia. (strong recommendation, low quality evidence)

Remarks:

- Refer to recommendations for populations for which magnesium sulfate is recommended. In situations when magnesium sulfate is contraindicated or not available, phenytoin may be used.

Recommendation 3:

The panel recommends magnesium sulfate over diazepam for the prevention of eclampsia. (strong recommendation, very low quality evidence)

Remarks:

- Refer to recommendations for populations for which magnesium sulfate is recommended. In situations when magnesium sulfate is contraindicated or not available, diazepam may be used.

Recommendation 4a:

The panel recommends interventionist care over expectant care in pregnant women with pre-eclampsia with severe features at <24 weeks gestational age when the fetus is not viable or unlikely to achieve viability within one or two weeks. (strong recommendation, low quality evidence)

Remarks:

- Clinicians will need to assess the viability of the fetus or likelihood to achieve viability in one or two weeks.
- This recommendation prioritizes the health of the mother, which is in line with most patients' values and preferences. A
- policy of interventionist care means early elective delivery by induction of labour or by caesarean section. A policy of expectant care means delayed delivery.

Recommendation 4b:

The panel suggests expectant care over interventionist care in pregnant women with pre-eclampsia (with or without severe features) at a gestational age of 24 to 33+6 weeks, provided that uncontrolled maternal hypertension, increasing maternal organ dysfunction or fetal distress are absent and can be monitored. (conditional recommendation, low quality evidence)

Remark:

- Expectant care can be defined as giving corticosteroids, stabilizing the woman's condition and aiming to delay delivery. Interventionist care is defined as delivery by either induction of labour or caesarean section after corticosteroids have been given to improve fetal lung maturation, usually after 24 to 48 hours.

Recommendation 4c (i & ii):

The panel suggests interventionist care over expectant care in pregnant women with pre-eclampsia with severe features at a gestational age of 34 to 36+6 weeks. (conditional recommendation, low quality evidence)

The panel suggests expectant care over interventionist care in pregnant women with pre-eclampsia without severe features at a gestational age of 34 to 36+6 weeks, provided that uncontrolled maternal hypertension, increasing maternal organ dysfunction or fetal distress are absent and can be monitored. (conditional recommendation, low quality evidence)

Remarks:

- Refer to the guideline document detailing definition of pre-eclampsia with and without severe features in the document introduction.

Recommendation 4d:

The panel recommends interventionist care over expectant care in pregnant women with pre-eclampsia (with or without severe features) and at a gestational age of ≥37 weeks. (strong recommendation, low quality evidence)

Remarks:

- A policy of interventionist care means early elective delivery by induction of labour or by caesarean section. A policy of expectant care means delayed delivery.

Recommendation 5a:

The panel suggests continuing antihypertensive medications in the postpartum period. (conditional recommendation, very low quality evidence)

Recommendation 5b:

The panel recommends monitoring blood pressure in the first postpartum week in all women with hypertensive disorders. (Good practice statement)

Remarks:

- High prevalence of hypertension postpartum in women with hypertensive disorders is associated with serious harm and potential for large benefits if blood pressure is monitored. For this reason, the panel made a good practice statement to monitor this population in the first postpartum week.

Recommendation 6:

The panel recommends magnesium sulfate over phenytoin for the treatment of eclampsia. (strong recommendation, low quality evidence)

Remarks:

- In situations when magnesium sulfate is contraindicated or not available, phenytoin may be used.

Recommendation 7:

The panel recommends magnesium sulfate over diazepam for the treatment of eclampsia. (strong recommendation, low quality evidence)

Remarks:

- In situations when magnesium sulfate is contraindicated or not available, phenytoin may be used.

8. Migraine Headache:Diagnosis & Management

I. DIAGNOSIS

Recommendation 1:

The panel recommends that clinicians do not use head MRI or CT imaging in patients with migraine or suspected of migraine that do not have other indications for imaging. (strong recommendation, very low quality evidence)

II. ACUTE PHARMACOLOGICAL MANAGMENT

Recommendation 2:

The panel suggests either metoclopramide or a NSAID in patients with acute migraine. (conditional recommendation, very low quality evidence) *Remark:* The panel determined that there is not enough evidence to favor one over the other.

Recommendation 3:

The panel suggests metoclopramide rather than a triptan in patients with acute migraine. (conditional recommendation, low quality evidence)

Recommendation 4:

The panel suggests a triptan rather than parcetamol in patients with acute migraine. (conditional recommendation, very low quality evidence)

Recommendation 5:

The panel suggests a combination of a triptan with a NSAID rather than a NSAID alone in patients with acute migraine. (conditional recommendation, low quality evidence)

Recommendation 6:

The panel suggests a combination of a triptan with a NSAID rather than a triptan alone in patients with acute migraine. (conditional recommendation, very low quality evidence)

III. PROPHYLACTIC PHARMACOLOGICAL MANAGMENT

Recommendation 7:

The panel suggests using beta-blockers for the prevention of migraine attacks. (conditional recommendation, low quality evidence)

Recommendation 8:

The panel suggests topiramate 50 to 100 mg daily for the prevention of migraine attacks. (conditional recommendation, moderate quality evidence)

Recommendation 9:

The panel suggests valproate 500 to 1000 mg daily for the prevention of migraine attacks. (conditional recommendation, low quality evidence)

Recommendation 10:

The panel suggests that clinicians use either topiramate or valproate for the prevention of migraine attacks. (conditional recommendation, very low quality evidence)

Remark: The panel found not enough evidence to favor one over the other.

Recommendation 11:

The panel suggests that clinicians do not use antiepileptics other than topiramate or valproate for the prevention of migraine attacks until more research about their efficacy and safety is available. (conditional recommendation, low quality evidence)

Recommendation 12:

The panel suggests that clinicians use either topiramate or beta-blockers for the prevention of migraine attacks. (conditional recommendation, low quality evidence)

Recommendation 13:

The panel suggests triptans for the prevention of menstrual-related migraine attacks. (conditional recommendation, low quality evidence)

Recommendation 14:

The panel recommends that clinicians do not use botulinum toxin A for the prevention of migraine attacks in patients with episodic migraine. (strong recommendation, moderate quality evidence)

Recommendation 15:

The panel suggests botulinum toxin A injections for prevention or recurrence of chronic migraine in patients who have not responded to other prophylactic treatments. (conditional recommendation, low quality evidence)

Recommendation 16:

The panel suggests tricyclic antidepressants for the prevention of migraine attacks. (conditional recommendation, low quality evidence)

Recommendation 17:

The panel suggests that clinicians do not use SSRIs for the prevention of migraine attacks until more evidence is available. (conditional recommendation, low quality evidence)

IV. PROPHYLACTIC NON-PHARMACOLOGICAL MANAGEMENT

Recommendation 18:

The panel suggests that more research is done on effectiveness and cost-effectiveness of education and self-management programs. (conditional recommendation, very low quality evidence)

9. Management of Overweight and Obese Adults

I. Non-pharmacological Management

Recommendation 1:

The panel suggests cognitive behavioural therapy (CBT) rather than no such therapy in overweight and obese adults. (conditional recommendation, low quality evidence)

Remarks:
This recommendation pertains to general obese populations. Individuals with suspected or confirmed eating disorders or depression require specialized psychiatric assessment and management.

Recommendation 2:

The panel suggests using intensive lifestyle modification rather than usual or minimal care in overweight and obese adults. (conditional recommendation, moderate quality evidence)

Remarks:
This recommendation pertains to those who are at higher risk for obesity-related co-morbidities such as diabetes as they would benefit more from intensive lifestyle interventions.

Recommendation 3:

The panel recommends lifestyle intervention rather than usual care alone in overweight and obese adults. (strong recommendation, moderate quality evidence)

Recommendation 4:

The panel recommends individualized counseling interventions rather than generic educational pamphlets in overweight or obese adults. (strong recommendation, low quality evidence)

Recommendation 5:

The panel makes no clinical recommendation regarding iso-caloric low-fat versus moderate-fat diets. The panel suggests randomized controlled trials be done with adequate follow-up duration that compare iso-caloric diets with fat content lower than 20%, approximately 20% and approximately 30%.(low quality evidence)

Remarks:
Panel members judged that there was not enough evidence to choose one option over another. If any diet is used, fat content should be determined according to AMDR and fat subtypes should be defined (saturated fatty acids, trans fatty acids, Omega 3 and 6 fatty acids) in order to evaluate benefits or harms.

Recommendations 6 & 7:

The panel recommends physical activity rather than no physical activity in overweight and obese adults. (strong recommendation, low quality evidence)

The panel recommends physical activity in addition to diet rather than a diet alone in overweight or obese adults. (strong recommendation, low quality evidence)

Recommendation 8:

The panel does not make a clinical recommendation on portion-controlled diets. The panel suggests that more research be done. (very low quality evidence)

II. Pharmacological Management

Recommendation 9:

The panel suggests metformin in obese or overweight adults. (conditional recommendation, low quality evidence)

Recommendation 10:

The panel suggests orlistat in obese and overweight adults. (conditional recommendation, moderate quality evidence)

Recommendation 11:

The panel suggests using bariatric surgery in obese adults (BMI ≥40 or ≥35 with comorbidities). (conditional recommendation, moderate quality evidence) *Remarks:* This recommendation pertains to individuals with larger BMI since anticipated benefits are larger in the setting of individuals who are at higher health risk due to obesity when considering risks associated with surgery. It also considers implementation requirements of interdisciplinary teams to prevent and manage lifelong dietary deficiencies, complications and weight management.

10. Management of Sickle Cell Disease

Recommendation 1:

In people sickle cell disease, the panel suggests using preoperative transfusion rather than no preoperative transfusion. (conditional recommendation, low quality evidence)

Remarks:

- Consider the severity of the disease and the type of the surgery
- Consider patients at high risk of stroke or other complications

Recommendation 2:

In people with sickle cell disease, the panel suggests conservative (simple) preoperative transfusion rather than aggressive (exchange) preoperative transfusion. (conditional recommendation, low quality evidence)

Remarks:

- In high risk patients (including those with previous history of stroke and repeated acute chest syndrome) an aggressive preoperative transfusion may be an equally reasonable choice
- In patients with a high baseline hemoglobin regardless of the haemoglobin S level an aggressive preoperative transfusion may be an equally reasonable choice

Recommendation 3:

In children with sickle cell disease up to the age of 5 years, the panel suggests using prophylactic antibiotics (penicillin) rather than no antibiotics for the prevention of pneumococcal infections. (conditional recommendation, low quality evidence)

Recommendation 4:

In patients with sickle cell disease, the panel suggests using deferoxamine rather than deferasirox for the management of secondary iron overload. (conditional recommendation, very low quality evidence)

Remarks:

- Regular monitoring of renal function and serum ferritin levels may be required

Recommendation 5:

In patients with sickle cell disease with a history of stroke and iron overload, the panel suggests using a combination of standard transfusion and a chelating agent rather than a combination of hydroxyurea and phlebotomy. (conditional recommendation, low quality evidence)

Recommendation 6:

In patients with sickle cell disease and pain, the panel suggests using cognitive behavioural therapy rather than no such therapy.(conditional recommendation, low quality evidence)

Recommendation 7:

In patients with sickle cell disease and chronic pain, the panel suggests patient education rather than no education. (conditional recommendation, low quality evidence)

Remarks:

- The choice of patient education modality will be based on available resources
- Patient education issues to include:
    1. Adequate oral hydration
    2. Avoiding vigorous physical activity
    3. Avoiding extreme weather exposure

Recommendation 8:

In pregnant women with sickle cell disease, the panel recommends a selective transfusion rather than a prophylactic transfusion. (strong recommendation, very low quality evidence)

Recommendation 9:

In people with sickle cell disease and painful crises, the panel recommends using adequate hydration rather than no hydration. (strong recommendation, low quality evidence)

Recommendation 10:

In patients with sickle cell disease and acute painful crises, the panel suggests using IV hydration rather than oral hydration. (conditional recommendation, very low quality evidence)

Remarks:

- Consider oral intake in a patients with sickle cell disease who are able to sustain a Per Oral (PO) intake

11. Management of Thalassemia – Iron chelation therapy, Bisphosphonates and Zinc Supplementation

Recommendation 1:

For thalassemia patients with iron overload, the panel suggests treatment with deferasirox rather than treatment with deferoxamine. (conditional recommendation, low quality of evidence)

Remarks:

- Informed patient choice is of paramount importance
- Iron overload, compliance and side effects should be monitored in patients while on chelation therapy, for details see "Regional consensus opinion" (Qari et al)[1]
- Dose of iron chelation drug needs to be tailored according to iron overload
- Deferoxamine should be considered as an alternative treatment in patient with adverse effects of deferasirox treatment or non-responsiveness to deferasirox therapy
- Patients need to be adequately educated and trained for deferoxamine administration
- For patients treated with deferoxamine: regular ophthalmologic examination and audiometry needs to be ensured
- In patients with severe iron overload and/or significant cardiac/endocrine impairment or non-responsiveness to monotherapy intensified chelation therapy (e.g. combination therapy) needs to be considered

Recommendation 2:

For thalassemia patients with iron overload, the panel suggests treatment with deferoxamine rather than treatment with deferiprone. (conditional recommendation, very low quality of evidence)

Remarks:

- Informed patient choice is of paramount importance
- Iron overload, compliance and side effects should be monitored in patients while on chelation therapy, for details see "Regional consensus opinion" (Qari et al)[1]
- Dose of iron chelation drug needs to be tailored according to iron overload
- Patients need to be adequately educated and trained for deferoxamine administration
- For patients treated with deferoxamine: regular ophthalmologic examination and audiometry needs to be ensured
- For patients treated with deferiprone: easy access to monitoring facilities (e.g. FBC), in particular in remote settings, needs to be ensured
- Deferiprone should be considered as an alternative treatment in patients with severe cardiac iron overload, cardiac and/or endocrine impairment, adverse effects of deferoxamine treatment or non-responsiveness to deferoxamine
- In patients with severe iron overload and/or significant cardiac/endocrine impairment or non-responsiveness to monotherapy intensified chelation therapy (e.g. combination therapy) needs to be considered

Recommendation 3:

For thalassemia patients with iron overload, the panel suggests treatment with deferoxamine alone rather than treatment with deferoxamine in combination with deferiprone. (conditional recommendation, very low quality of evidence)

Remarks:

- Informed patient choice is of paramount importance
- Iron overload, compliance and side effects should be monitored in patients while on chelation therapy, for details see "Regional consensus opinion" (Qari et al)[1]
- Dose of iron chelation drug needs to be tailored according to iron overload
- Patients need to be adequately educated and trained for deferoxamine administration
- For patients treated with deferoxamine: regular ophthalmologic examination and audiometry needs to be ensured
- For patients treated with deferiprone: easy access to monitoring facilities (e.g. FBC), in particular in remote settings, needs to be ensured
- Combination therapy should be considered as an alternative treatment in patients with severe cardiac iron overload, cardiac and/or endocrine impairment or non-responsiveness to monotherapy

Recommendation 4:

For thalassemia patients with iron overload, the panel suggests against treatment with deferoxamine in combination with deferiprone rather than treatment with deferiprone alone. (conditional recommendation against, very low quality of evidence)

Remarks:

- Informed patient choice is of paramount importance
- Iron overload, compliance and side effects should be monitored in patients while on chelation therapy, for details see "Regional consensus opinion" (Qari et al)[1]
- Dose of iron chelation drug needs to be tailored according to iron overload
- For patients treated with deferiprone: easy access to monitoring facilities (e.g. FBC), in particular in remote settings, needs to be ensured
- For patients treated with deferoxamine: regular ophthalmologic examination and audiometry needs to be ensured
- Patients need to be adequately educated and trained for deferoxamine administration
- Combination therapy should be considered as an alternative treatment in patients with severe cardiac iron overload, cardiac and/or endocrine impairment or non-responsiveness to monotherapy

Recommendation 5:

For patients with thalassemia-associated osteoporosis, the panel suggests against treatment with bisphosphonates rather than treatment with bisphosphonates. (conditional recommendation against, very low quality of evidence)

Remarks:

- Vitamin D, calcium and bone density should be monitored in patients with thalassemia
- Prevention and first line treatment of thalassemia-associated osteoporosis should be based on vitamin D and calcium supplementation
- Patients with a history of fractures and/or proven severe osteoporosis should be referred to an endocrinologist; jointly, a decision about treatment with bisphosphonates in selected patients should be made

Recommendation 6:

For children and adolescents with thalassemia major, the panel suggests zinc supplementation rather than no zinc supplementation. (conditional recommendation, very low quality of evidence)

Remarks:

- Practically all patients with thalassemia major are receiving (or will receive) iron chelation therapy which can interact with zinc metabolism
- Serum zinc levels should be monitored in patients with iron chelation therapy
- Patients with proven zinc deficiency should receive zinc supplementation

12. Diagnosis of Suspected First Deep Vein Thrombosis of Lower Extremity

Recommendation 1:

The Saudi Expert Panel recommends the use of a clinical strategy to assess the pretest probability based on Wells criteria compared to not using a strategy, for the diagnosis of suspected first lower extremity DVT. (Strong recommendation, Moderate quality of evidence)

Recommendation 2:

The Saudi Expert Panel recommends the use of highly sensitivity D-dimer (ELISA) as an initial test for the diagnosis of DVT in patients with low pretest probability of first lower extremity DVT. (Strong recommendation, Moderate quality of evidence)

Recommendation 3:

The Saudi Expert Panel recommends the use of proximal CUS as an initial test for the diagnosis of DVT in patients with low pretest probability of first lower extremity DVT. (Strong recommendation, Low quality of evidence)

Recommendation 4:

The Saudi Expert Panel suggests the use of highly sensitive D-dimer (ELISA) rather than proximal CUS as an initial test for the diagnosis of DVT in patients with low pretest probability of first lower extremity DVT. (Weak recommendation, Low quality of evidence)

Recommendation 5:

The Saudi Expert Panel recommends no further testing over further investigation with proximal CUS in patients with low pretest probability of first lower extremity DVT and negative highly sensitive D-dimer test (ELISA). (Strong recommendation, Low quality of evidence)

Recommendation 6:

The Saudi Expert Panel recommends no further investigation rather than venography in patients with low pretest probability of first lower extremity DVT, after negative initial proximal CUS (Strong recommendation, Low quality of evidence)

Recommendation 7:

The Saudi Expert Panel recommends performing proximal CUS rather than venography in patients with low pretest probability of first lower extremity DVT and positive highly sensitive D-dimer test (ELISA) (Strong recommendation, Low quality of evidence)

Recommendation 8

The Saudi Expert Panel recommends no further investigation, rather than confirmatory venography, in patients with low pretest probability of first lower extremity DVT and positive proximal CUS. (Strong recommendation, Low quality of evidence)

Recommendation 9:

The Saudi Expert Panel recommends the use of highly sensitivity D-dimer (ELISA) as an initial test for the diagnosis of DVT in patients with moderate pretest probability of first lower extremity DVT. (Strong recommendation, Moderate quality of evidence)

Recommendation 10:

The Saudi Expert Panel recommends the use of proximal CUS as an initial test for the diagnosis of DVT in patients with moderate pretest probability of first lower extremity DVT. (Strong recommendation, Low quality of evidence)

Recommendation 11:

The Saudi Expert Panel suggests the use of highly sensitive D-dimer (ELISA) rather than proximal CUS as an initial test for the diagnosis of DVT in patients with moderate pretest probability of first lower extremity DVT. (Weak recommendation, Low quality of evidence)

Recommendation 12:

The Saudi Expert Panel recommends no further testing over further investigation with proximal CUS in patients with moderate pretest probability of first lower extremity DVT and negative highly sensitive D-dimer test (ELISA). (Strong recommendation. Low quality of evidence)

Recommendation 13:

The Saudi Expert Panel recommends performing proximal CUS rather than venography in patients with moderate pretest probability of first lower extremity DVT and positive highly sensitive D-dimer test (ELISA). (Strong recommendation, Low quality of evidence)

Recommendation 14:

The Saudi Expert Panel suggests no further testing rather than repeat proximal CUS in patients with a moderate pretest probability of first lower extremity DVT and negative initial proximal CUS. (Weak recommendation, Low quality of evidence)

Recommendation 15:

The Saudi Expert Panel suggests repeating proximal CUS in one week over no further testing in patients with moderate pretest probability of first lower extremity DVT and initial negative proximal CUS and positive highly sensitive D-dimer test (ELISA) (Weak recommendation, Low quality of evidence)

Recommendation 16:

The Saudi Expert Panel recommends no further investigation, rather than confirmatory venography, in patients with moderate pretest probability of first lower extremity DVT and positive proximal CUS. (Strong recommendation, Low quality of evidence)

Recommendation 17:

The Saudi Expert Panel recommends against the use of highly sensitivity D-dimer (ELISA) as a standalone test to rule out DVT in patients with high pretest probability of first lower extremity DVT. (Strong recommendation, Moderate quality of evidence)

Recommendation 18:

The Saudi Expert Panel recommends against the use of proximal CUS as a standalone test to rule out DVT in patients with high pretest probability of first lower extremity DVT. (Strong recommendation, Moderate quality of evidence)

Recommendation 19:

The Saudi Expert Panel recommends no further investigation, rather than confirmatory venography, in patients with high pretest probability of first lower extremity DVT and positive proximal CUS. (Strong recommendation, Moderate quality of evidence)

Recommendation 20:

The Saudi Expert Panel recommends repeating proximal CUS in one week rather than no further testing in patients with a high pretest probability of first lower extremity DVT and negative initial proximal CUS. (Strong recommendation, Moderate quality of evidence)

Recommendation 21:

The Saudi Expert Panel recommends additional testing with highly sensitive D-dimer (ELISA) rather than no further testing in patients with high pretest probability of first lower extremity DVT and initial negative proximal CUS. (Strong recommendation, Low quality of evidence)

Recommendation 22:

The Saudi Expert Panel recommends repeating proximal CUS in one week over performing venography in patients with a high pretest probability of first lower extremity DVT, negative initial proximal CUS and positive highly sensitive D-dimer test (ELISA). (Strong recommendation, Low quality of evidence)

Recommendation 23:

The Saudi Expert Panel recommends no further testing rather than venography in patients with high pretest probability of first lower extremity DVT and negative serial proximal CUS. (Strong recommendation, Moderate quality of evidence)

Recommendation 24:

The Saudi Expert Panel recommends no further testing rather than venography in patients with high pretest probability of first lower extremity DVT, negative D-dimer test (ELISA) and negative proximal CUS. (Strong recommendation, Low quality of evidence)

13. Treatment of Venous Thromboembolism

Recommendation 1:

For patients with simple acute DVT of the leg, the Saudi Expert Panel suggests home treatment over hospital treatment (conditional recommendation; moderate quality evidence)

Remarks:

- Ensure that patients have support from family, access to a phone, access to a physician, and the ability to get to a hospital in a reasonable time if needed
- Consider patient level of education, knowledge about the disease, and likelihood of compliance
- Consider hospital treatment for patients with severe acute DVT of the leg and patients who are apprehensive
- This recommendation applies to anticoagulation treatment with LMWH but not NOACs

Recommendation 2:

For patients with low risk acute PE, the Saudi Expert Panel suggests early discharge over late discharge (conditional recommendation; moderate quality evidence)

Remarks:

- Use a validated prediction rule (e.g. Pulmonary Embolism Severity Index) to risk stratify patients
- Ensure that patients have a close follow-up appointment
- Ensure that patients have support from family, access to a phone, access to a physician, and the ability to get to a hospital in a reasonable time if needed
- Consider patient level of education, knowledge about the disease, and likelihood of compliance
- Consider hospital treatment for patients with severe acute DVT of the leg and patients who are apprehensive
- This recommendation applies to anticoagulation treatment with LMWH but not NOACs
- Highly selected cases be discharged home as opposed to being admitted and discharged early

Recommendation 3:

For outpatients with cancer, the Saudi Expert Panel suggests against thromboprophylaxis with heparin (conditional recommendation; moderate quality evidence)

Remarks:

- Use a validated tool (e.g., Khorana JNCCN 2011;9:789-798) to risk stratify patients, as those at higher risk for VTE are more likely to benefit
- This recommendation does not apply to patients, who would otherwise have an indication for prophylaxis. Examples include: immobility, long distance travel, highly thrombogenic drugs (e.g., thalidomide, lenalidomide, hormonal therapy, angiogenesis inhibitors)
- See separate recommendation for oral anticoagulation

Recommendation 4:

For outpatients with cancer, the Saudi Expert Panel recommends against thromboprophylaxis with oral anticoagulation (strong recommendation; moderate quality evidence)

Key consideration:

- This recommendation does not apply to patients, who would otherwise have an indication for prophylaxis. Examples include: immobility, long distance travel, highly thrombogenic drugs (e.g., thalidomide, lenalidomide, hormonal therapy, angiogenesis inhibitors)
- See separate recommendation for heparin anticoagulation

Recommendation 5:

For outpatients with cancer and CVC, the Saudi Expert Panel suggests thromboprophylaxis with parenteral anticoagulation (weak recommendation; moderate quality evidence)

Remarks:

- Use a validated tool (e.g., Khorana JNCCN 2011;9:789-798) to risk stratify patients, as those at higher risk for VTE are more likely to benefit
- This recommendation does not apply to patients, who would otherwise have an indication for prophylaxis. Examples include: immobility, long distance travel, highly thrombogenic drugs (e.g., thalidomide, lenalidomide, hormonal therapy, angiogenesis inhibitors)
- See separate recommendation for oral anticoagulation

Recommendation 6:

For outpatients with cancer and CVC, the Saudi Expert Panel suggests against thromboprophylaxis with oral anticoagulation (weak recommendation; low quality evidence)

Remarks:

- Use a validated tool (e.g., Khorana JNCCN 2011;9:789-798) to risk stratify patients, as those at higher risk for VTE are more likely to benefit
- This recommendation does not apply to patients, who would otherwise have an indication for prophylaxis. Examples include: immobility, long distance travel, highly thrombogenic drugs (e.g., thalidomide, lenalidomide, hormonal therapy, angiogenesis inhibitors).
- Option could be offered to patients interested in thromboprophylaxis but averse to using injections (with LMWH)
- See separate recommendation for parenteral anticoagulation

Recommendation 7:

In patients with cancer being initiated on treatment for venous thromboembolism, the Saudi Expert Panel suggests LMWH over IV UFH (conditional recommendation; very low quality evidence)

Recommendation 8:

In patients with metastatic cancer requiring long term treatment of venous thromboembolism, the Saudi Expert Panel recommends LMWH over VKA (strong recommendation; moderate quality evidence)

In patients with non-metastatic cancer requiring long term treatment of venous thromboembolism, Saudi Expert Panel suggests LMWH over VKA (weak recommendation; moderate quality evidence)

Remarks:

- Patients who are apprehensive about injections may prefer VKA over LMWH.
- Patients who choose VKA will require closer monitoring.

14. Prophylaxis of VTE in Medical Patients and Long Distance Travelers

Thromboprophylaxis in acutely ill medical patients

Recommendation 1:

1a: In acutely ill hospitalized medical patients at high risk of VTE the panel recommends heparin (UFH/LMWH) versus no heparin for the prophylaxis of VTE. (strong recommendation, moderate quality evidence)

1b: In acutely ill hospitalized medical patients at low risk of VTE the panel suggests not using heparin for the prophylaxis of VTE. (conditional recommendation, low quality evidence)

Remarks:

- Risk stratification should be based on a validated risk stratification tool (e.g., Padua Prediction Score)
- Decision to provide thromboprophylaxis should consider the patients' risk of bleeding.

Recommendation 2:

In acutely ill hospitalized medical patients the panel suggests using LMWH versus UFH for the prophylaxis of VTE. (conditional recommendation, low quality evidence)

Remark: In case of renal failure, use of UFH is preferred

Recommendation 3:

In acutely ill hospitalized medical patients the panel recommends a regular duration (i.e., up to 10 days) versus an extended duration (i.e., up to 30 or 40 days) for the thromboprophylaxis of VTE. (strong recommendation, moderate quality evidence)

Recommendation 4:

4a: In acutely ill hospitalized medical patients at low risk of VTE the panel recommends against using GCS for prophylaxis of VTE. (strong recommendation, low quality evidence)

4b: In acutely ill hospitalized medical patients at high risk of VTE and bleeding (who cannot receive pharmacological prophylaxis) the panel suggests using GCS for the prophylaxis of VTE. (conditional recommendation, low quality evidence)

Remarks:

1. Consider monitoring for skin lesions and ischemia
2. Physician must ensure proper fitting

Recommendation 5:

5a: In acutely ill hospitalized medical patients at low risk of VTE the panel recommends against using IPC/SCD for prophylaxis of VTE. (conditional recommendation, low quality evidence)

5b: In acutely ill hospitalized medical patients at high risk of VTE and bleeding (who should not receive pharmacological prophylaxis) the panel suggests using IPC/SCD for the prophylaxis of VTE. (conditional recommendation, low quality evidence)

Remarks: The choice between mechanical prophylaxis options (GCS versus IPC/SCD) will depend on the local availability and patient preference.

Thromboprophylaxis in critically ill medical patients

Recommendation 6:

In critically ill medical patients the panel recommends heparin versus no heparin for the prophylaxis of VTE. (strong recommendation, low quality evidence)

Remark: Decision to provide thromboprophylaxis should consider the patients' risk of bleeding

Recommendation 7:

In critically ill medical patients the panel suggests LMWH versus UFH for the prophylaxis of VTE. (conditional recommendation, low quality evidence)

Remark: In case of renal failure, use of UFH is preferred

Recommendation 8:

8a: In critically ill medical patients the panel suggests not using GCS for prophylaxis of VTE. (conditional recommendation, very low quality evidence)

8b: In critically ill medical patients at high risk of bleeding and in whom pharmacological prophylaxis is not feasible and in settings where IPC is not available the panel suggests using GCS for prophylaxis of VTE. (conditional recommendation, very low quality evidence)

Remarks:

1. Consider monitoring for skin lesions and ischemia
2. Physician must ensure proper fitting
3. Ensure appropriate use of GCS (thigh length versus knee length)

Recommendation 9:

9a: In critically ill medical patients who are bleeding or at high risk of bleeding, the panel suggests using IPC/ SCD for the prophylaxis of VTE. (conditional recommendation, very low quality evidence)

9b: In critically ill medical patients at high risk of VTE receiving pharmacological prophylaxis the panel suggests adding IPC/ SCD for the prophylaxis of VTE. (conditional recommendation, very low quality evidence)

Thromboprophylaxis in chronically ill patients

Recommendation 10:

In chronically ill medical patients the panel suggests not using versus using prophylaxis for VTE. (conditional recommendation, very low quality evidence).

Thromboprophylaxis in Long Distance Travelers

Recommendation 11:

In long distance high-risk travelers (>8hrs) the panel suggests frequent ambulation for the prophylaxis of VTE. (conditional recommendation, very low quality evidence).

Recommendation 12:

In long distance high-risk travelers (>8hrs) the panel suggests calf muscle exercise for the prophylaxis of VTE. (conditional recommendation, very low quality evidence).

Recommendation 13:

In long distance high-risk travelers (>8hrs) the panel suggests sitting in an aisle seat for the prophylaxis of VTE. (conditional recommendation, very low quality evidence).

Recommendation 14:

In long distance travelers (>8hrs) at increased risk of VTE, the panel suggests using pharmacological thromboprophylaxis. (conditional recommendation, very low quality evidence).

Recommendation 15:

In long distance high-risk travelers (>8hrs) the panel suggests not using GCS for the prophylaxis of VTE. (conditional recommendation, very low evidence).

15. Prevention of venous thromboembolism in general abdominal-pelvic surgery and major orthopedic surgery

Recommendations 1-3:

For patients undergoing general and abdominal-pelvic surgery at low risk of VTE (e.g. Caprini score ≤2), the panel suggests using LMWH (conditional recommendation, moderate quality evidence), unfractionated heparin (conditional recommendation, moderate quality evidence) or intermittent pneumatic compression devices (conditional recommendation, low quality evidence) rather than no prophylaxis.

Recommendations 4-6:

For patients undergoing general and abdominal-pelvic surgery at moderate risk of VTE (e.g. Caprini score 3-4), the panel recommends using unfractionated heparin rather than no prophylaxis (strong recommendation, moderate quality evidence), and suggests using LMWH (conditional recommendation, moderate quality evidence) or intermittent pneumatic compression devices (conditional recommendation, low quality evidence) rather than no prophylaxis.

Recommendations 7-9:

For patients undergoing general and abdominal-pelvic surgery at moderate risk of VTE (e.g. Caprini score 3-4) and high risk of bleeding, the panel recommends using unfractionated heparin rather than no prophylaxis (strong recommendation, moderate quality evidence), and suggests using LMWH (conditional recommendation, moderate quality evidence) or intermittent pneumatic compression devices (conditional recommendation, low quality evidence) rather than no prophylaxis.

Recommendations 10-12:

For patients undergoing general and abdominal-pelvic surgery at high risk of VTE (e.g. Caprini score ≥ 5), the panel recommends using LMWH (strong recommendation, moderate quality evidence) or unfractionated heparin (strong recommendation, moderate quality evidence) rather than no prophylaxis, and suggests using intermittent pneumatic compression devices (conditional recommendation, low quality evidence) rather than no prophylaxis.

Recommendations 13-15:

For patients undergoing general and abdominal-pelvic surgery at high risk of VTE (e.g. Caprini score ≥ 5) and high risk of bleeding, the panel recommends using LMWH (strong recommendation, moderate quality evidence), unfractionated heparin (strong recommendation, moderate quality evidence) or intermittent pneumatic compression devices (strong recommendation, low quality evidence) rather than no prophylaxis.

Recommendation 16:

In patients undergoing major orthopedic surgery (total hip arthroplasty, total knee arthroplasty or hip fracture surgery), the panelsuggests using LMWH rather than no prophylaxis (conditional recommendation, low quality evidence).

Recommendation 17:

In patients undergoing major orthopedic surgery (total hip arthroplasty, total knee arthroplasty or hip fracture surgery), the panelsuggests using LMWH rather than Vitamin K Antagonists (VKA) (conditional recommendation, low quality evidence).

Recommendation 18:

In patients undergoing major orthopedic surgery (total hip arthroplasty, total knee arthroplasty or hip fracture surgery), the panel recommends extended prophylaxis (up to 35 days) with LMWH rather than short-term prophylaxis (7-14 days) (strong recommendation, moderate quality evidence).

16. Management of STEMI

Recommendation 1:

The panel suggests using fibrinolytic therapy over delayed PPCI if there is a total time delay >120 minutes. (conditional recommendation, very low quality evidence)

Remarks:

- The total time delay of 120 minutes refers to the period from the first contact with the patient to the provision of PPCI.
- For patients presenting directly to a PCI-capable facility the suggested acceptable time delay to provision of PPCI is 90 minutes (i.e. door-to-balloon time).

Recommendation 2:

The panel suggests against using fPPCI in patients with STEMI. (conditional recommendation, very low quality evidence)

Remark:

- Facilitated PPCI (fPPCI) should not be confused with a pharmacoinvasive PPCI strategy

Recommendation 3:

The panel recommends against routine use of aspiration or thrombus extraction devices in patients with STEMI. (strong recommendation, moderate quality evidence)

Recommendation 4:

The panel suggests multi-vessel PPCI over culprit-only PCI for patients with multi-vessel coronary artery disease undergoing PPCI. (conditional recommendation, low quality evidence)

Remarks:

- This recommendation is based on evidence with data predominantly from patients undergoing multi-vessel PCI during the index procedure, but the procedure may also be considered during the index hospitalization.
- This recommendation does not apply to patients with cardiogenic shock.

Recommendation 5:

The panel recommends early revascularization for patients with cardiogenic shock due to STEMI. (strong recommendation, moderate quality evidence)

Recommendation 6:

The panel suggests immediate angiography followed by PCI where indicated over usual care in patients with presumed STEMI who are resuscitated but remain unconscious after a cardiac arrest. (conditional recommendation, very low quality evidence)

Remarks:

- For patients with unwitnessed out of hospital arrest, without documented time of arrest, the clinician may re-evaluate the patient for PCI with detailed assessment of the patient's neurological status before proceeding with a potentially futile intervention.

Recommendation 7:

The panel suggests prioritizing the management of patients with STEMI to high volume centres. (conditional recommendation, very low quality evidence)

Remark:

- The implementation of this recommendation should not restrict care for patients who require PPCI in settings where only low-volume centres are available.

Recommendations 8, 9, 10:

The panel suggests rescue PCI over conservative management (conditional recommendation, low quality evidence) and suggests rescue PCI over repeated fibrinolysis(conditional recommendation, low quality evidence) in patients with STEMI who failed to reperfuse after fibrinolytic therapy. The panel suggests not offering repeated fibrinolysis in patients with STEMI who fail to reperfuse after fibrinolytic therapy (conditional recommendation, low quality evidence).

Remarks:

- When there is no available urgent access for the patient at a catheterization lab for the rescue PCI procedure, treating clinicians should determine availability of rescue PCI for such patients.
- There should not be a repeated administration of streptokinase. The risk of adverse events with repeat administration of streptokinase is higher than the benefit.

Recommendation 11:

The panel suggests routine early angiography over routine deferred or selective angiography in patients with STEMI successfully treated by fibrinolysis. (conditional recommendation, moderate quality evidence)

17. Antithrombotic Treatment of Patients with Non-valvular Atrial Fibrillation

Recommendations 1-3:

For patients with non-valvular atrial fibrillation at low risk of stroke (e.g. CHADS2 score = 0), the Saudi Expert Panel suggests no antithrombotic therapy rather than aspirin (weak recommendation, moderate quality evidence) or oral anticoagulation (weak recommendation, moderate quality evidence)

For patients who choose antithrombotic therapy, the Saudi Expert Panel suggests the use of aspirin (75 mg to 325 mg once daily) rather than oral anticoagulation (weak recommendation, moderate quality evidence)

Remarks:
The Saudi Expert Panel issued weak recommendations against the use of antithrombotics in patients with non-valvular atrial fibrillation at low risk of stroke because it considered that the undesirable consequences of the use of antithrombotics (i.e. small increase of the risk of bleeding, burden of treatment and resource utilization) probably outweigh the benefits (i.e. small reduction of the risk of stroke). However, patients who place an exceptional high value in stroke prevention and a relatively low value in the risk of bleeding are likely to opt for antithrombotic therapy. Other factors that may influence the choices above are the individual risk of bleeding and presence of additional risk factors for stroke, not considered by the $CHADS_2$ score: age over 65 years, female gender or the presence of vascular disease (previous myocardial infarction, peripheral artery disease or the existence of an aortic plaque). The concurrence of multiple non-$CHADS_2$ risk factors for stroke may favor oral anticoagulation over aspirin.

Recommendations 4-6:

For patients with non-valvular atrial fibrillation at intermediate risk of stroke (e.g. $CHADS_2$ score = 1), the Saudi Expert Panel recommends oral anticoagulation rather than no antithrombotic therapy (strong recommendation, high quality evidence) or aspirin (strong recommendation, moderate quality evidence) and suggests oral anticoagulation rather than aspirin plus clopidogrel (weak recommendation, moderate quality evidence)

Remarks:
The Saudi Expert Panel considered that in patients at intermediate risk of stroke, the desirable consequences of using oral anticoagulation rather than aspirin plus clopidogrel (i.e. stroke reduction) probably outweigh the undesirable consequences (i.e. burden of treatment and costs). However, aspirin plus clopidogrel might be an alternative to patients that are unsuitable for or choose to not take oral anticoagulants (Vitamin K Antagonists or novel anticoagulants) for reasons other than concerns about the risk of bleeding.

Recommendations 7-9:

For patients with non-valvular atrial fibrillation at high risk of stroke (e.g. $CHADS_2$ score = 2 or greater), the Saudi Expert Panel recommends oral anticoagulation rather than no antithrombotic therapy (strong recommendation, high quality evidence), aspirin (strong recommendation, moderate quality evidence) or aspirin plus clopidogrel (strong recommendation, moderate quality evidence)

Recommendation 10:

For patients with non-valvular atrial fibrillationin whom oral anticoagulation is recommended (or suggested), the Saudi Expert Panel suggests the use of Novel Oral Anticoagulants (dabigatran 150 mg bid, rivaroxaban 20 mg once a day or apixaban 5 mg bid) rather than Vitamin K antagonists (weak recommendation, high quality evidence)

Remarks

For patients who are well controlled and without complications with VKA, the decision to switch to NOACs should be individualized to the specific clinical circumstances and patients' preferences.

Clinicians and patients should be aware that uncommon but serious adverse effects associated with the use NOACs might emerge over the long term.

Dose adjustments may be necessary for special populations: Dabigatran 110 mg could be an alternative for the elderly (over 75 years) and for patients with an increased risk of bleeding, while rivaroxaban 15 mg could be used in patients with mild renal impairment (Creatinine clearance 30 to 60 mL/min)

Dabigatran is excreted mainly by the kidneys. Rivaroxaban and apixaban also have an important renal excretion. NOACs have not been studied and are contraindicated in patients with severe renal impairment (estimated creatinine clearance of less than 30 mL/min).

18. Use of Thrombolytic Therapy in Acute Stroke

Recommendation 1:

The Saudi Expert Panel recommends using IV r-tPA in patients with acute ischemic stroke presenting within 3 hours of symptoms onset (Strong recommendation, high quality of evidence).

Remarks:
Patients with high bleeding risk and resulting concerns about thrombolytic therapy should not receive r-tPA. There should be more attention toward improving the feasibility and overcoming barriers to implementation. This may include enhancing public awareness and education, establishment of stroke units, availability of physicians, radiologists and radiology technicians, and incentives to compensate for workload and working hours.
Centers that are equipped to administer IV r-tPA may refer to and implement the internationally available quality measures, for example recording mortality, disability and ICH rates, rate of thrombolytic therapy use and door to needle time.

Recommendation 2:

The Saudi Expert Panel suggests using IV r-tPA in patients with acute ischemic stroke presenting between 3 to 4.5 hours of symptoms onset. (Weak recommendation, low quality of evidence).

Remarks:
Patients with absolute contraindication to thrombolytic therapy should not receive r-tPA. The generalizability of this recommendation to patients with diabetes mellitus and old stroke, and patients with large stroke (NIHSS>25) is less certain.
There should be more attention toward improving the feasibility and overcoming barriers to implementation. This may include enhancing public awareness and education, establishment of stroke units, availability of physicians, radiologists and radiology technicians, and incentives to compensate for workload and working hours.
Centers that are equipped to administer IV r-tPA may refer to and implement the internationally available quality measures, for example recording mortality, disability and ICH rates, rate of thrombolytic therapy use and door to needle time.

Recommendation 3:

The Saudi Expert Panel recommends against using IV r-tPA in patients with acute ischemic stroke presenting after 4.5 hours of symptoms onset. (Strong recommendation, moderate quality of evidence).

Recommendation 4:

The Saudi Expert Panel suggests using IA r-tPA initiated within 6 hours of symptoms onset in patients with acute ischemic stroke due to proximal cerebral artery occlusion or patients who cannot receive IV r-tPA (Weak recommendation, low quality of evidence).

Remarks:
Studies contributing to this recommendation included exclusively patients with MCA occlusion. Resources required to implement this intervention are large, it requires availability of equipment and trained healthcare providers. This recommendation may not apply to centers that are not equipped to administer IA r-tPA. Cost effectiveness data are lacking for the context of KSA.

Recommendation 5:

The Saudi Expert Panel suggests not using combination of IV and IA r-tPA over IV r-tPA. (Weak recommendation, very low quality of evidence)

Recommendation 6:

The Saudi Expert Panel suggests against using mechanical thrombectomy in the management of patients with acute ischemic stroke. (Weak recommendation, low quality of evidence).

Remark:
Some carefully selected patients who value the uncertain benefits of mechanical thrombectomy more than the associated risk may choose this intervention.

19. Prevention of Venous Thromboembolism in Patients with Stroke

Recommendation 1:

The Saudi Expert Panel recommends using prophylactic dose heparin in patients with acute ischemic stroke and restricted mobility (strong recommendation, moderate quality of evidence).

Remark:
Starting prophylactic dose heparin should be delayed for 24 hours in patients who received thrombolytic therapy.

Recommendation 2:

The Saudi Expert Panel suggests using prophylactic dose LMWH over UFH in patients with acute ischemic stroke and restricted mobility. (Weak recommendation, moderate quality of evidence).

Recommendation 3:

The Saudi Expert Panel recommends using IPC in patients with acute ischemic stroke and restricted mobility. (Strong recommendation, moderate quality of evidence).
Remark:
IPC should be considered in patients who cannot receive prophylactic low dose heparin, and should be avoided in patients who have peripheral vascular disease.

Recommendation 4:

The Saudi Expert Panel suggests against using elastic compression stocking for VTE prevention in patients with ischemic stroke and restricted mobility (Weak recommendation, moderate quality of evidence).

Recommendation 5:

The Saudi Expert Panel suggests using prophylactic dose heparin in patients with hemorrhagic stroke and restricted mobility. (Weak recommendation, low quality of evidence).

Recommendation 6:

The Saudi Expert Panel suggests early (within days 2 to 4) use of prophylactic dose heparin for VTE prevention in patients with hemorrhagic stroke and restricted mobility. (Weak recommendation, very low quality of evidence).

Recommendation 7:

The Saudi Expert Panel suggests using prophylactic dose LMWH over UFH in patients with hemorrhagic stroke and restricted mobility. (Weak recommendation, very low quality of evidence).

Remark:
Very low quality of evidence suggests that the use of LMWH or UFH may be safe in patients with hemorrhagic stroke. However, comparative studies in this population are lacking.

Recommendation 8:

The Saudi Expert Panel suggests using IPC in patients with hemorrhagic stroke and restricted mobility. (Weak recommendation, low quality of evidence).

20. Allergic Rhinitis in Asthma

Recommendation 1: Seasonal/intermittent Allergic Rhinitis

The Saudi Expert Panel recommends Intranasal corticosteroids for treatment of adults with seasonal or intermittent allergic rhinitis (Strong recommendation; Moderate-quality evidence).

Remarks:
Health care practitioners in the Middle East should be encouraged to explain the use of INCSs in greater depth to their patients especially about the time required to reach the desired symptom relief.

Recommendation 2: Perennial/persistent Allergic Rhinitis

The Saudi Expert Panel suggests Intranasal corticosteroids for treatment of adults with perennial or persistent allergic rhinitis (Conditional recommendation; Low-quality evidence).

Remarks:
Health care practitioners in the Middle East should be encouraged to explain the use of INCSs in greater depth to their patients especially about the time required to reach the desired symptom relief.

Recommendation 3: Seasonal/intermittent Allergic Rhinitis

The Saudi Expert Panel recommends Intranasal corticosteroids rather than intranasal H1-antihistamines for treatment of adults with seasonal or intermittent allergic rhinitis (Strong recommendation; High-quality evidence).

Remarks:
In steroidphobic patients and in patients with contraindications for INCS the alternative choice may be equally reasonable.
Health care practitioners in the Middle East should be encouraged to explain the use of INCSs in greater depth to their patients especially about the time required to reach the desired symptom relief.

Recommendation 4: Perennial/persistent Allergic Rhinitis

The Saudi Expert Panel suggests Intranasal corticosteroids rather than intranasal H1-antihistamines for treatment of adults with perennial or persistent allergic rhinitis (Conditional recommendation; Low-quality evidence).

Remarks:
In steroidphobic patients the alternative choice may be equally reasonable.
Health care practitioners in the Middle East should be encouraged to explain the use of INCSs in greater depth to their patients especially about the time required to reach the desired symptom relief.

Recommendation 5: Seasonal/intermittent Allergic Rhinitis

The Saudi Expert Panel suggests sublingual immunotherapy for treatment of adults with seasonal or intermittent allergic rhinitis (Conditional recommendation; Moderate-quality evidence).

Remarks:
The SLIT should be used only when all other regular options do not work: It is more appropriate for those with moderate to severe AR who do not respond to first line therapy.
The SLIT Should not be started during pregnancy, but could be continued if the woman has already started the treatment.

Recommendation 6: Perennial/persistent Allergic Rhinitis

The Saudi Expert Panel suggests sublingual immunotherapy for treatment of adults with perennial/persistent allergic rhinitis (Conditional recommendation; Very low-quality evidence).

Remarks:
The SLIT should be used only when all other regular options do not work: It is more appropriate for those with moderate to severe AR who do not respond to first line therapy.
The SLIT Should not be started during pregnancy, but could be continued if the woman has already started the treatment.

Recommendation 7: Seasonal/intermittent Allergic Rhinitis

The Saudi Expert Panel suggests sublingual immunotherapy for treatment of children younger than 18 years old with seasonal or intermittent allergic rhinitis (Conditional recommendation;

Moderate-quality evidence)

Remarks:
The SLIT should be used only when all other regular options do not work: It is more appropriate for those with moderate to severe AR who do not respond to first line therapy.
The SLIT Should not be started during pregnancy, but could be continued if the woman has already started the treatment.

Recommendation 8: Perennial/persistent Allergic Rhinitis

The Saudi Expert Panel suggests sublingual immunotherapy be not used for treatment of children younger than 18 years old with perennial or persistent allergic rhinitis (Conditional recommendation; Very low-quality evidence)

Remarks:
In special situations in children not responding to maximal medications may be referred to an allergy specialist for evaluation of indications for immunotherapy.

21. Timing of Initiation of Dialysis

Recommendation:

The Saudi Expert Panel recommends against an "intent- to- start-early" and recommends for an "intent-to-defer" strategy for initiation of dialysis in adult patients (age 18 years or older) with stage 5 CKD (an eGFR <15 ml/min/1.73m^2) (strong recommendation, moderate quality of evidence)

Remarks:

- This recommendation applies to adult patients who are 18 years old or older and does not apply to adolescence between 13 and 18 years old. The Saudi Expert Panel agreed that patients aged 13-18 years are likely to behave clinically different than adults for many reasons including small body size and going through maturity period. This group of patients (13-18 years old) is considered adult by the KSA MoH regulations and they are typically admitted to adult inpatient services. This creates a challenge in managing dialysis patients in this age group due to variation in comfort level among adult nephrologists who are expected to deal with this group especially when admitted.

- This recommendation applies to patients planning to use either chronic hemodialysis or chronic peritoneal dialysis. We do not consider pre-emptive transplantation, initiation of dialysis after failed transplant, urgent initiation of dialysis for acute kidney failure, conservative management without dialysis, or paediatric populations.

- Patients comorbidities and age, modality education and selection, rate of decline in eGFR, local waiting time for access (vascular access creation and maturation or peritoneal dialysis catheter insertion), access to interventional radiology and

diagnostic imaging and availability of staff, physical space, equipment, or other resources requires for provision of a chosen modality are all factors that may influence the decision about timing of initiation of dialysis.

- Adherence to this recommendation requires availability of timely follow-up with a nephrologist to closely monitor clinical indications for dialysis initiation. These clinical indications for the initiation of dialysis include: symptoms of uremia, refractory fluid overload, hyperkalemia or acidemia, or other conditions or symptoms that are likely to be ameliorated by dialysis. In the absence of these factors, eGFR should not serve as a sole criterion for the initiation of dialysis unless it is ≤ 6 ml/min/1.72m^2.

- The 'intent-to-defer' strategy pertains specifically to timing of dialysis initiation, and does not mean that patients should be referred to nephrologists at a later stage (lower level of kidney function).

22. Role of Vitamin D, Calcium and Exercise in Fracture Prevention in Elderly

Recommendation 1:

For fracture and/or fall prevention in the elderly living in the community, the Saudi Expert Panel suggests not offering Vitamin D supplementation alone. (conditional recommendation; low quality evidence)

Remarks:

- This recommendation does not apply to patients who are diagnosed as vitamin D deficient.

Recommendation 2:

For fracture and or fall prevention in elderly living in the community, the Saudi Expert Panel suggests Vitamin D and Calcium for patients at high risk fractures and low risk of cardiovascular disease. (conditional recommendation; low quality evidence)

Recommendation 3:

For fracture and/or fall prevention in the elderly living in the community, the Saudi Expert Panel recommends not offering Calcium supplementation alone. (strong recommendation; low quality evidence)

Remarks:

- This recommendation does not apply to patients with hypocalcaemia states.

Recommendation 4:

For fracture and/or fall prevention in the elderly living in the community, the Saudi Expert Panel suggests individual exercise performed at home. (conditional recommendation; low quality evidence)