病人教育

地區心臟中心

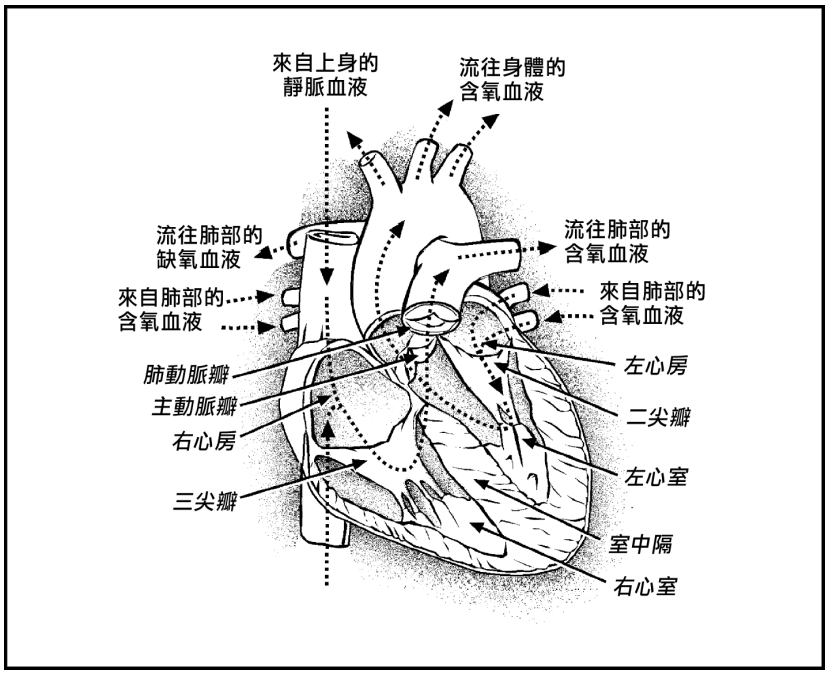
心臟病

本手冊描述心臟疾病，包括：

- **心臟的構造和功能 。**
- **心臟疾病的類型。**
- **危險因素。**
- **心臟檢查的類型。**
- **幫助你瞭解更多有關心臟知識的資源。**

心臟的結構與功能

心臟屬於肌肉組織。它就像一個泵，有 4 個室，每個室像拳頭般大小。每個心臟約拳頭般大小，其主要功能是把含氧的血液從肺部供應到全身。心臟位於胸腔正中偏左的地方，每分鐘泵出大約 5 誇脫的血液。它由胸板（胸骨）和胸腔保護。上面有兩個收集回流血液的室稱爲*心房*。下面兩個泵血室稱爲心室。心臟有 4 片單向瓣膜，可確保血液往正確的方向流動。



血液流過心臟的心房和心室。

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靜脈把血液從身體各個部分輸送到右心房。血液從右心房流到右心室，然後被泵送到肺部。肺部將血液中的二氧化碳清除掉，並用氧氣取代。血液流回到心臟，進入左心房，再流到左心室，然後被泵送到大動脈裏。動脈把這含氧的血液輸送到身體的其他部分。

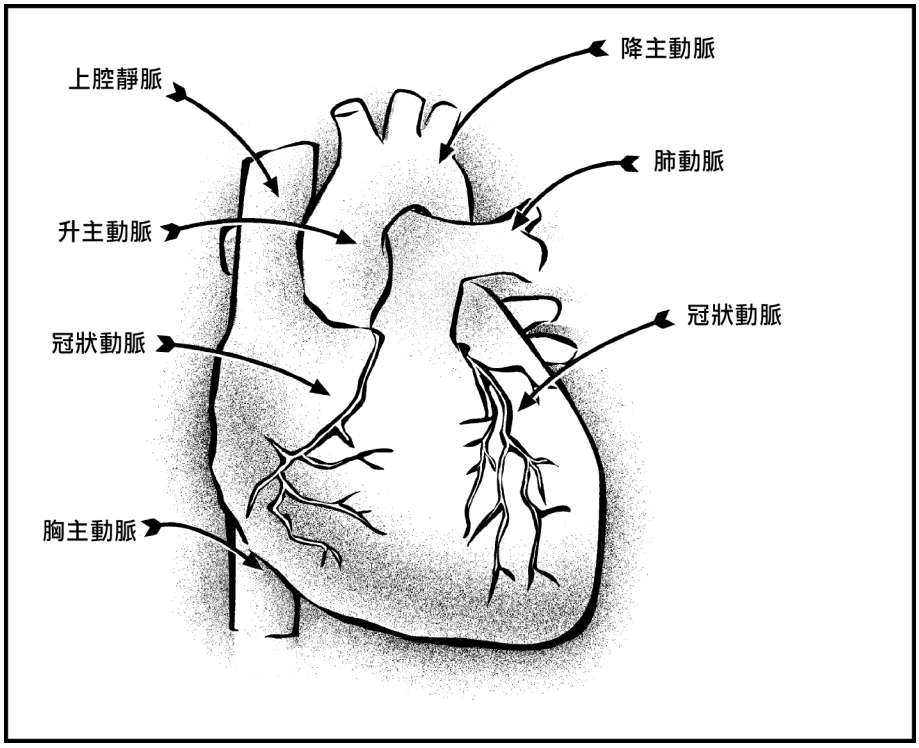
心臟要工作必需有一個電脈衝來產生心搏。心臟中的特殊細胞能夠發出電流來刺激心肌，使其收縮。心臟的“天然起搏器” - 即*竇房* (SA) 結 - 不斷產生電信號。

SA 結位於心臟的右上腔（右心房）裏。 電信號通過左右心房進入心臟中央的一個部位，這部位稱作*房室*（AV）結。電信號再通過特殊的途徑從 AV 結傳送到左右心室的各部分，使其收縮。此活動順序稱為*正常竇節律*，可以在做心電圖（ECG）時記錄下來。

通常，心臟每分鐘跳動 60 至 80 次。隨著每次跳動引起的血液波動就是我們感覺到的脈搏。有時，心臟的電系統可能發生故障，使電信號不能正常地抵達負責泵血的心室，或使信號遲滯或不規則。這些不正常的節律稱為“心律失常。”

心肌需要氧氣和營養。心臟從稱為*冠狀動脈*的動脈系統攝取營養。冠狀動脈為叉狀分開，因而能夠向整個心肌供給含氧血液。

右冠狀動脈供血給心臟的右側。左冠狀動脈有兩條主要分支 2 條延伸到心臟的前部，另一條延伸到心臟的後部。當冠狀動脈堵塞時，便會產生冠狀動脈疾病（CAD），這種病會導致心絞痛或心臟病發作。



心臟的動脈。

冠狀動脈疾病

冠狀動脈疾病（亦稱*冠狀動脈粥樣硬化*或*局部缺血性心臟病*）係指冠狀動脈在限制給心肌供氧時發生的變化或過程。這是一種緩慢的漸進性疾病，患病後動脈的內層變厚並變得不規則，導致膽固醇和鈣的沉積。

這些沉積物稱為*斑塊*。隨著斑塊的積聚，動脈變得狹窄。這個過程造成了正常血流的阻塞。動脈壁的痙攣也會引起血管變窄。由痙攣或斑塊而引發的冠狀動脈狹窄或阻塞都會導致心臟局部缺血，即向部分心肌供應的含氧血液被暫時減少了。

冠狀動脈疾病最常見的症狀是*心絞痛*。 心絞痛是在胸部常常反復出現的不適感，但有時這種不適感也會出現在頸部、臂部或齶部。這種不適感往往被描寫為“壓迫感”或“悶塞感” ，其痛的程度從微痛到整個胸部都有一種嚴重的擠壓感不等。

心絞痛會在做運動時、遭遇寒冷時、飽餐一頓後、情緒受壓抑時或疲勞時發生。這時心率加快，血壓上升，因為心肌需要更多的氧氣，而部分阻塞的冠狀動脈卻不能供給充足的氧氣。絞痛通常僅持續幾分鐘，通常休息一下或服用硝酸甘油即可緩解。硝酸甘油能迅速擴張冠狀動脈，增加供應給心臟的血流量。

如果胸痛是由身體勞累或情緒壓抑引起，但休息後就消失，這種胸痛稱為*穩定心絞痛*。如果胸痛在休息時發生，持續時間超過幾分鐘，或發作頻率增加或不可預料，則稱為*不穩定心絞痛*。

心絞痛的治療方法包括服藥和手術治療，例如氣球導管擴張術、鐳射血管成形術、硬化粥狀物切除術、冠狀動脈小支架置入術和冠狀動脈旁路移植術（CABG）等。

心臟病發作

心臟病發作係在向心臟供血被突然阻塞時發生。這會導致心肌損傷。這也稱為*急性冠狀動脈綜合征*。

冠狀動脈粥樣硬化與心臟病發作有關。動脈粥樣硬化是膽固醇沉積物和其他脂肪物質開始分佈在動脈內壁時發生的一種疾病。 這通常稱為斑塊。原因尚未查明，這種斑塊可能會破裂，從而形成血塊。血塊阻止血流，心臟組織就會持久受損，導致心臟病發作。

當心臟病發作時，部分心肌會因血液和氧氣供給停止或嚴重減少而死亡。這個部位周圍的心肌也可能受損。心臟病發作時，部分心臟的泵血能力將會大大降低。心臟損傷越大，心臟正常功能的損失就越大。

當心臟受損部分痊癒後，會形成疤痕來增強此部位。痊癒過程大約需要 4 到 6 個星期的時間，但這要視心臟受損程度和痊癒速度而定。有些人可能需要施行血管成形術、冠狀動脈小支架置入術，或冠狀動脈旁路移植術來幫助恢復供給心臟某些部位的血流量。

在心臟病發作後住院的頭幾天裏，您將被禁止活動。之後，要限制活動，直到心臟痊癒為止。 大多數患者在心臟病發作後的數周或數月內就能恢復他們的正常活動。

心臟病發作時可能發生的症狀包括：

- 胸部、齶部、肩膀、臂部或上腹部出現疼痛或不明原因的不適。
- 冒汗。
- 氣促。
- 噁心。
- 暈眩。

心臟病發作隨時隨地突然發生。大多數患者會感覺到心臟病發作的部分或全部症狀，但也可能毫無症狀就發生。

這些症狀在一些人身上可能顯得十分嚴重，而在另一些人身上卻是輕微的和/或間歇性的。如果這些症狀中有任何一種或全部出現，應該馬上給予救援。分秒必爭，這是生死攸關的大事。

大約有百分之 30 的患者因為呼救遲緩，甚至來不及抵達醫院就死去。及早治療能增加心臟病發作的生存機會，而且有助於防止對心肌的嚴重損害。

當心臟受損時，便容易產生不正常的心律（*心律失常*）。最嚴重的心律失常是*心室纖維性顫動*（VF），這時心臟停止泵血。住院時，心律可以受到密切的監測，如果發生 VF ，可“電擊”心臟來恢復正常的心律。

在心臟病發作期間進行內科治療，能減少對心臟的永久損害程度。對於某些患者，可以泡制一些溶解血塊的藥物來恢復血流量（*栓溶療法*）。可以用*經皮腔內冠狀動脈血管成形術*（ PTCA ）或*氣球導管擴張術*來增加流往心臟患處的血流量。也可以埋置冠狀動脈小支架以助冠狀動脈張開。這些療法如果在發病最初一兩個小時內使用是最有效的。如果你感到任何與心臟病發作有關的症狀，應該馬上求醫。

心臟危險因素

冠心病（CAD）是一種緩慢的漸進性疾病。業已證明有許多因素會增加人們患 CAD 的危險。控制這些因素可能有助於減慢這種疾病的發展。要瞭解這些危險因素，並要懂得可以做些什麼來控制這些因素。

CAD 的危險可以分成 2 類：可控制的與不可控制的。

不可以控制的患 CAD 的危險因素：

- 有 CAD家族史
- 男性

家族史/遺傳

有些人在成年早期就患上 CAD。其原因不清楚。如果您的家庭中有成員患上心臟病，要辨別諸如吸煙或緊張等其他您可以控制的因素。鼓勵其他家庭成員也這樣做，這樣便可以在疾病出現前開始預防。

男性

男性心臟病的發生率比女性高。然而，女性到更年期時，由於內分泌變化，她們的心臟病發生率會增加。儘管許多人並沒有意識到這一點，但是心臟病是女性死亡的最常見原因。

可以控制的患 CAD 的危險因素：

- 吸煙
- 高血壓
- 血液膽固醇升高
- 糖尿病
- 緊張 / “A 型”人格
- 體重
- 坐式生活方式

吸煙

對大多數人來說，吸煙是患冠狀動脈疾病的最大危險因素。它使人們心臟病發作的危險加倍，並增加了人們患肺炎、肺氣腫、肺癌和其他呼吸道疾病的危險性。

戒煙是您能夠為自己的心肺健康做到的一件最重要的事情。最近的研究表明，吸二手煙也會使非吸煙者有患肺癌和其他呼吸道疾病的危險。

當您停止吸煙後，您的身體就開始自行修補，除非它已受到不可逆的損害。從您戒煙之日起，您患心臟病的危險就會減少，並且在 3、5 年內，您患病的危險性變得和非吸煙者相似。

吸煙危害心臟的幾種方式：

- 減少輸送到心肌的氧氣。
- 引起動脈狹窄和痙攣，從而導致血壓升高、心律加快，這兩者會使心臟工作更吃力。
- 增加血栓形成的機會。
- 消極地影響了血液膽固醇的水準。

戒煙的好處：

- 減少患心臟病、肺部疾病和癌症的機會。
- 改善味覺和嗅覺。
- 提高體能。
- 您的房子和衣服不會有煙味。
- 您的牙齒和手更清潔。
- 節省金錢。

戒煙貼士

- **下決心永遠戒煙。**“斷然戒掉壞習慣”的方法往往最有效。只要您不耽擱，漸進的方法是很好的。
- **定一個戒煙日期，定了就執行。**把您的決定告訴家人和朋友。
- **扔掉您家裏和汽車裏的所有香煙（和/或煙鬥、雪茄）、打火機及煙灰缸。**“仔细清理”一下您的汽車有助於除掉車內的煙味。
- **在您的周圍營造一個非吸煙環境。**不到那些會引誘您吸煙的地方或場合。

- **喝大量的水或果汁。**這有助於消除您體內的尼古丁。
- **避免咖啡因** 如果喝咖啡成了與吸煙相連的習慣。
- **如果您仍戒不掉手指要夾著香煙的感覺**，可夾鉛筆或紙夾等其他東西來代替。
- **如果您仍戒不掉嘴裏要含著香煙的感覺**，試用牙籤、硬糖、胡蘿蔔棒、蘋果或口香糖來代替。
- **消除緊張** 通過做深呼吸，做操或洗個暖水浴來消除緊張。
- **將原本會花在煙草上的錢存起來**，用以吃點特別的東西來獎勵自己。
- **最重要的是，不要以為“只抽一根，不會傷身，” 因為一根就會傷身**。

如果你想瞭解更多戒煙的方法，或需要更多幫助去戒煙，美國癌症協會 (American Cancer Society) 提供各種戒煙計劃。在電西雅圖，請致電 206-283-1152，否則，請撥打免費電話 800-227-2345。或者，向你的護士索取一本 UWMC 編寫的“戒煙或使用煙草之資源”手冊。

高血壓

當血液被心臟泵出流過動脈時，它會衝擊動脈壁。這種衝擊動脈壁的力稱為*血壓*。 *高血壓*是患冠狀動脈疾病的一個危險因素。

血壓由兩個數字組成 — 例如 120/80。上面的數字表示*收縮壓*。它代表心臟泵出一股新血液後動脈內的壓力。

下面的數字是*舒張壓*。這是心臟再次跳動前處於靜止狀態時動脈內的壓力。血液越難流過血管，這兩個數字就越大，心臟的勞損也越嚴重。

可以接受的血壓值應在一定的範圍內。對於大部分成人，血壓低於 120/80 是可以接受的。如果你是成人，而你的收縮壓在 120 到 139 之間，或你的舒張壓在 80 到 89 之間，又或 2 者都是這樣，那麼，你便屬於“高血壓前期患者”。高血壓係指患者在一段長時間內，其收縮壓等於或高於 140，和/或舒張壓等於或高於 90。

收縮壓或舒張壓不正常的升高都會增加心臟的負擔，因而增加了患 CAD 的危險。甚至輕微的升高也會造成很大的損害。高血壓可能沒有症狀，因此一旦診斷出來，必須監測而且終生治療。

大約百分之 90 的高血壓是原因不明的。控制高血壓有許多措施：

- 控制體重。
- 戒煙。
- 經常運動。
- 吃低鈉（低鹽）食物。
- 管理好自己的壓力。
- 定期量血壓。
- 如果醫生給您開藥了，要按醫囑服藥。

膽固醇

膽固醇高的人患 CAD 的危險更大。肝臟製造人體功能所需的全部膽固醇。當您進食了高膽固醇的食物，您體內的膽固醇便超過所需。若出現這種情況，您的身體便會在您的動脈壁內積累起脂肪類物質，稱為斑塊。斑塊會逐漸阻礙流向心臟的血液。

瞭解您的膽固醇濃度。血液測試可以顯示您的濃度。要得到準確的數據，在抽血前 12 個小時不可以進食任何食物或飲料（開水除外）。

血液測試會給出總膽固醇濃度。理想的總膽固醇濃度應小於 200。測試還會顯示低密度脂蛋白 (LDL) 膽固醇和高密度脂蛋白 (HDL)膽固醇的濃度。

LDL 被稱為“壞”的膽固醇，人們認為這種膽固醇會加快脂肪的積累和增加血管內壁的膽固醇。對於患有冠狀動脈疾病的人，LDL 最好低於 110。

HDL 被稱為“好”的膽固醇，人們認為這種膽固醇可以從血流和動脈壁中去除脂肪和膽固醇，並將它們送回到肝臟中處理。經常運動、保持健康體重和不吸煙的人，血液中的 HDL 通常較濃。一個人的 HDL 濃度最好高於或等於 40。

治療高膽固醇濃度通常從營養咨詢開始。降低您的總脂肪、飽和脂肪和膽固醇攝入量是明智的，可以幫助降低您患上心臟疾病的危險。

改變飲食後，應該每隔 1 至 3 個月去檢查膽固醇濃度。如果膽固醇濃度仍在昇高，醫生會為您開降低膽固醇的藥物。

糖尿病

糖尿病是引發 CAD 危險的因素。目前並不太清楚引發冠狀動脈疾病的確切機制。然而，已經知道長年患糖尿病會破壞大小血管。

糖尿病人如果還有其他危險因素，患心臟疾病的危險則更高。

糖尿病人通過食用低脂食品，控製他們的體重和戒煙，可以降低患上心臟疾病的危險。

壓力/“A 型”個性

有大量的证据显示，一個人的個性可能是患上 CAD 的危險因素。具有“A 型”個性的人可能是：

- 好競爭
- 注重時間
- 急躁
- 進取
- 魯莽
- 非常積極
- 緊張
- 非常成功
- 不願放鬆，因為內疚
- 總是匆匆忙忙

“A 型”個性經常導致情緒壓力和情緒緊張增加，從而導致身體產生腎上腺素。這使心臟搏動加快和加強，導致血管受壓迫或變窄。此外，在壓力期間，情緒緊張會產生高血壓和提高血液膽固醇濃度。

改變“A 型”個性

辨認出您身體的壓力信號 — 僵硬、緊繃的肩膀或頸部肌肉、心情緊張，胃酸過多等。當您出現這些信號時，可透過有意識地放鬆或想像其他事情來中斷它們。

- ❑ 辨認出所處環境中引起緊張的東西並嘗試減少這些東西。
- ❑ 保持生活中工作、玩樂和休息的平衡。

- ❑ 進行有規律的鍛煉 — 每星期至少 3 次。
- ❑ 進行冥想或放鬆練習。
- ❑ 設定小的具體的目標。一次只完成 1 個目標。
- ❑ 避免匆匆忙忙。採用從容不迫的步幅。
- ❑ 每次做 1 項運動，然後給自己一些時間休息。

進一步學習放鬆和減輕壓力。有些學院和機構提供這些課程和研討會，例如美國心臟協會，電話 206-632-6881。

體重

身體超重會導致患上 CAD 的危險，還會導致其他危險，包括高血壓、糖尿病和血液膽固醇濃度升高。過重也會令心臟負荷更大，並會由於壓力及過度疲勞引致骨骼受傷。

達到和保持一個理想體重是控製患病危險的重要一步。控製體重的關鍵是節制、多樣化、鍛煉和毅力。

減重時，要逐步進行。長期成功取決於養成新的和更好的飲食習慣。飲食要有節制。進食各種食物以保證所有必需的營養。

避免急速節食餐單 — 它們限製您每天攝入低於 1,000 卡路里的熱量。每星期穩定減少 1 到 2 磅是安全的，且更易保持。您可能需要配合營養師製定一個適合您的卡路里限製計劃。

逐漸增加每天的運動量。當您準備好後，可開始常規的有氧鍛煉運動，例如慢走或游泳。長期的鍛煉計劃對減重和保持健康至關重要。在開始任何鍛煉計劃之前，先去您的醫生那裏做檢查，以確保這些鍛煉適合您。

減重貼士

1. 增加體育運動。
2. 減少進食脂肪和高脂食物。
3. 減少進食糖類和甜食。
4. 避免酒精飲品。

用其他東西代替食物來獎勵自己減重。例如，買件新衣服、看一出電影或外出旅遊一次等。

坐式生活方式

坐式生活方式係指一個人在工作或閑暇時，很少或沒有進行任何體育運動的生活方式。這些人如果還有其他危險因素，就更容易得心絞痛和心臟疾病。通常，保持鍛煉可以幫助減少心臟的負荷。當身體經調節後，心臟的運作將更有效。其他益處包括：

- 改善循環。
- 增強關節靈活性和肌肉狀況。
- 增加力量和持久性。
- 改善血液膽固醇濃度。
- 體重減輕。
- 改善血壓。
- 更強的處理壓力的能力。
- 緊張得以釋放。
- 改善安寧的感覺。
- 減少壓力/沮喪。

有規律的鍛煉通常係指持續進行一項運動 20 到 30 分鐘，每星期 3 到 4 次。請與你的醫生商討你的鍛煉計劃，並逐步提高到所建議的鍛煉水平。

酒精與心臟

很多人想知道有心臟病的人喝酒是否安全。酒精對心臟的影響因人而異，取決於每個人的具體情況。如果您對喝酒有任何問題，最好直接諮詢您的醫生。

過量的酒精攝入會導致患高血壓、中風、癌症和肝硬化的危險增高。也會損壞心臟肌肉，引起傳導阻塞而導致心律不齊（即正常的、有規律的心跳出現中斷）。

酒精會加快心率，並會輕微減少心肌收縮。這就是為何您喝酒後應該避免進行運動或其他劇烈活動。

心臟測試

心導管插入術（冠狀動脈造影術）

描述： 此項試用於檢查供血給心肌的冠狀動脈。把一條導管（狹窄的顯像管）插入腹股溝或手臂的一條動脈內，然後借助熒光鏡（X 光機）小心地將導管引到心臟。將比對用造影劑通過導管注射到冠狀動脈中，它們的影像被錄在膠片上。這些影像顯示動脈有否變窄或阻塞。

測試時間： 1 到 3 小時。需要特別指引以及您的同意書。

測試地點： 心導管實驗室。

冠狀動脈電腦斷層血管造影 (Coronary CTA)

描述： 本程序是研究心臟微細血管的內部狀況，無需用儀器探入到你的心臟內部。電腦斷層掃描術 (CT) 的掃描器僅在心臟跳動 5 次後便能掃描整個心臟。放射科醫生和技術人員會從你的靜脈注射造影劑到你的血管。當造影劑抵達心臟血管後，CT 掃描器在極短時間內拍下數千張照片。稍後將所有圖像拼合起來，放射科醫生便能透過圖像診斷出動脈的堵塞情況。

測試時間： 30 分鐘。

測試地點： 放射科。

心電圖 (ECG, EKG, 12 Lead)

描述： 心電圖是對心臟電功能的記錄。在每隻手腕和腳踝上附上電極塊，另外在胸膛上的六個點上亦附上電極塊。然後進行記錄，共有 12 幅心臟電活動圖供醫生參閱。這樣，醫生便可判斷心臟有否有任何心律不齊、壓力或損害。

測試時間： 5 到 10 分鍾。無需特別準備。

測試地點： 附近的心臟中心或地區心臟中心。

心臟超聲波檢查（回聲，心臟超聲波）

描述： 將一個小裝置（傳感器）置於受測者的胸膛，利用此裝置發出的聲波而產生心臟圖像。聲波碰到心臟反彈回來，並被送回螢幕，該裝置然後將其記錄在膠片上。這些圖像有助於鑑別心肌或心臟瓣膜是否異常，還可檢測心臟週圍是否存在液體。

測試時間： 30 分鍾到 1 小時。

測試地點： 附近的心臟中心或地區心臟中心。

電生理研究 (EP Study, EPS)

描述： 此項測試用於提供心臟電功能更精確的資訊，由受過專門培訓的心臟病專家操作。把一條導管（窄顯像管）插入腹股溝的一條動脈內，然後用熒光鏡（X 光機）小心地將導管引到心臟。導管到位後，便開始測量心臟的電活動。

測試時間： 2 到 4 小時。測試前後均需特別指引以及您的同意書。

測試地點： 電生理學實驗室，2 樓。

24 小時心電圖（可移動心電圖）

描述： 此裝置能記錄心臟在一段時間內的電活動，可以在家或在醫院使用。將電極塊置於受測者的胸膛，並用電綫連接到一個小型記錄儀（大小相當於一個小型的便携式錄音機），記錄儀則穿在肩帶或腰帶上。

測試時間： 在測試期間，要求受測者記錄下每天活動、症狀和服藥情況，以便可以找出不正常心律是與哪種活動相關。

測試地點： 地區心臟中心。

磁共振成像 (MRI) 心臟掃描

描述： 本掃描使用無線電波和強磁場代替 X 射線來提供清晰精細的心臟圖片。磁共振成像 (MRI) 檢查一般由 2 到 6 張連續的圖片組成，每張圖片持續 2 到 15 分鐘。每組圖片顯示出心臟的橫切面。

測試時間： 30 分鐘到 1 個小時。

測試地點： 放射科。

放射性核素心室造影 (RNVG)、核醫心室功能檢查 (MUGA) 、核子醫學心臟檢查

描述： 這些測試提供有關心臟泵血能力的資訊。將極少量的放射性物質注射入靜脈。用一個特製的相機攝下放射性物質隨著每次心跳穿過心臟的活動。

測試時間： 1 到 2 小時。

測試地點： 核醫學部。

肺功能測試 (PFT)

描述： 此項測試用於測量肺功能。受測者被要求向一台儀器作多次的吸氣和呼氣。

測試時間： 30 到 45 分鍾。

測試地點： 肺功能實驗室。

遠程監測

描述： 通過無綫信號，將心臟的電活動發送到護士工作站或受測者房間的心臟監測設備。將電極塊置於受測者的胸膛，並連接到一個小型幹電池遙控盒（像晶體管收音機般大小）。可以將該裝置放入掛在脖子上的袋中或衣服的口袋中隨身攜帶，因而可以在受測者逐漸增加活動量時不間斷地監測其心律。

測試時間： 住院時不斷監測。

測試地點： 床邊。

壓力測試

壓力測試用於診斷冠狀動脈疾病或心絞痛。下列是最常用的測試類型：

運動耐受性測試（ETT，跑步機）

描述： 此項測試用於測定受測者的運動耐受性，以及在運動過程中任何異常心率和/或心臟供血不足。將電極塊置於受測者的胸膛，並連接到跑步機心電圖 (ECG) 電腦，它會記錄運動中從心臟傳出的電信號。當受測者在跑步機上行走和/或跑步時，受測者的 ECG、血壓和脈搏會被記錄下來。

測試時間： 45 分鐘到 1 個小時。

測試地點： 地區心臟中心。

鉈壓力測試、 Sestamibi 壓力測試、潘生丁/腺甘酸、多巴酚丁胺壓力測試

描述： 這些測試用於比較在有壓力和在休息時流過心肌的血流量。鉈和 sestamibi 壓力測試涉及在跑步機上行走和/或跑步。潘生丁和多巴酚丁胺壓力測試則涉及注射兩種指定藥物的其中一種，以引起心臟壓力，而不是透過真實運動。這兩種類型的壓力測試都使用放射性掃描來探測是否有冠狀動脈疾病存在及其嚴重程度。讓受測者休息，同時向其注射非常少量的放射性物質，半小時到 1 小時後，開始拍攝受測者的心臟圖片，然後，再在運動或用藥物引至壓力時拍攝受測者的心臟圖片。運動部分的研究可能會首先進行。

測試時間： 所有這些程式的掃描時間（拍攝圖片）大約需要半個小時。整個測試可以在 1 到 2 天內完成，可能需要特別指引。

測試地點： 核醫學部。

負荷超聲心動圖（運動反射波、多巴酚丁胺反射波）

描述： 此項測試檢查在休息和在壓力下心肌的功能。當流向心肌的血流量減少時，心肌的運動會改變。這些改變可以用超聲心動圖（見超聲心動圖）檢測出來。此項測試開始時作為一種運動耐受性測試，可透過真實運動，或透過靜脈內 (IV) 注射多巴酚丁胺藥物來導致心肌壓力。由超聲心動圖技師記錄下在測試壓力部分之前和之後的心臟圖像。

測試時間： 1 個半小時。

測試地點： 地區心臟中心。

更多資訊

有關心臟健康的書籍很多，這些書籍可以幫您增加運動、減輕壓力、控製體重以及改善整體健康。您可以到圖書館借閱，或向傳統的書店或網絡書籍銷售商購買。

請你的醫生爲你推薦一些相關的書籍和網站。

書籍

飲食/烹飪/減重

有很多極好的烹飪書籍和關于健康烹飪及飲食均衡的雜誌。可參閱由美國心臟協會、Dean Ornish、Joseph Piscatella 和 Brenda Ponichtera 編寫的書目。 此外，在 UWMC 出版的《心臟健康營養》中，還列出很多極好的資訊。

情緒方面

- *The Healing Heart*，作者 Norman Cousins
- *Transitions：Making Sense of Life's Changes* ，作者 William Bridges

鍛煉

- *Burning Fat, Getting Fit: Exercise and Your Heart, A Guide to Physical Activity*，作者 美國心臟協會
- *Fitting in Fitness*，作者 美國心臟協會

性事

- *Heart Illness and Intimacy*，作者 Wayne Sotile
- *The Sensuous Heart: Guidelines for Sex After a Heart Attack or Heart Surgery*，作者 Suzanne Cambre

有問題嗎？

請致電 206-598-4300

您的問題很重要。如果您有任何問題或關注的事情，請致電您的醫生或醫療護理提供者。UWMC 診所的醫務人員亦可隨時提供幫助。

地區心臟中心/
心血管診所：
206-598-4300

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壓力管理

- *Don't Sweat the Small Stuff*，作者 Richard Carlson
- *The Relaxation Process*，作者 Herbert Benson
- *The Relaxation and Stress Process*，作者 Martha Davis, et. al.

網站

美國心臟協會
www.americanheart.org

本網站提供數十個廣受尊重的網站的鏈結，包括大量的政府機構、大學、研究中心、科學組織和其他資源的列表。

Harvard Heart Letter
www.health.harvard.edu

本網站爲 UWMC 臨床醫生所推薦，提供很多關於心臟疾病、復康和心臟健康生活方式的詳盡資訊。請點擊 "Newsletters" (通訊)，然後點擊 "Harvard Heart Letter" （哈佛心臟醫學通訊）。

UNIVERSITY OF WASHINGTON
MEDICAL CENTER
UW Medicine

Regional Heart Center
Box 356087
1959 NE Pacific St. Seattle, WA 98195
206-598-4300

Heart Disease
Chinese
10/2001 Rev 06/2008
Reprints: Health Online

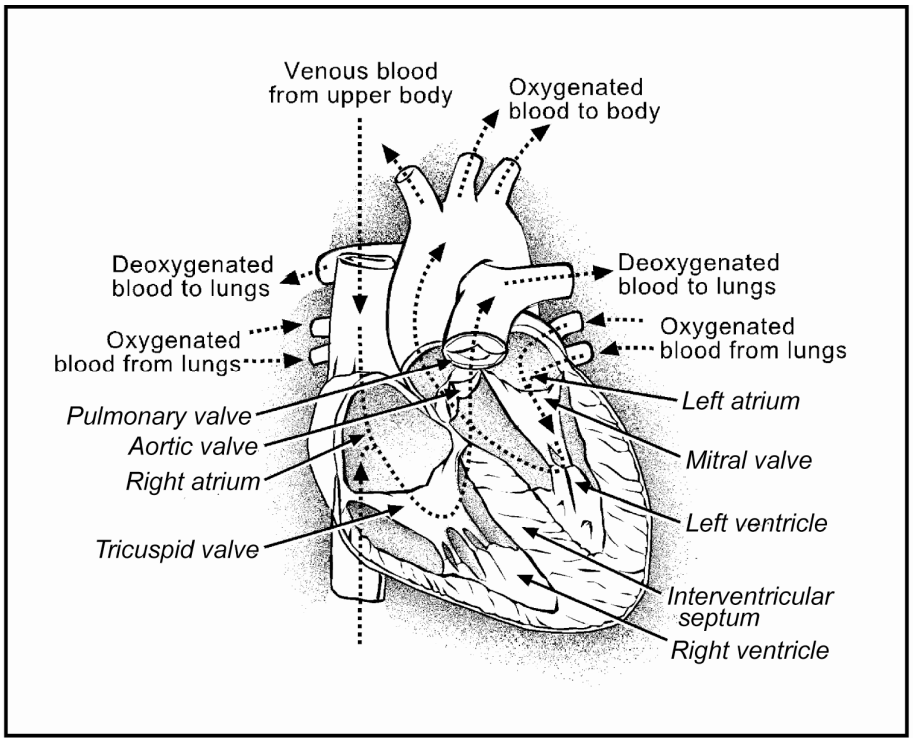
Heart Disease

This manual describes heart disease, including:

- **The structure and function of the heart.**
- **Types of heart disease.**
- **Risk factors.**
- **Types of heart tests.**
- **Resources to help you learn more.**

Structure and Function of the Heart

The heart is a muscle. It is a pump with 4 chambers, each about the size of a fist. Its main function is to supply oxygen-rich blood from the lungs to all parts of the body. The heart, which lies slightly to the left of center in the chest, pumps about 5 quarts of blood each minute. It is protected by the sternum (breastbone) and rib cage. The two collecting chambers on top are called the *atria*. The lower pumping chambers are called the *ventricles*. The heart has 4 one-way valves that keep blood flowing in the correct direction.



Blood flow through the chambers of the heart.

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Veins bring blood from throughout the body to the right atrium. The blood flows from the right atrium to the right ventricle and is pumped to the lungs. In the lungs, carbon dioxide is removed and replaced with oxygen. The blood comes back to the heart into the left atrium, flows to the left ventricle and then is pumped into the aorta. Arteries carry this oxygen-rich blood to the rest of the body.

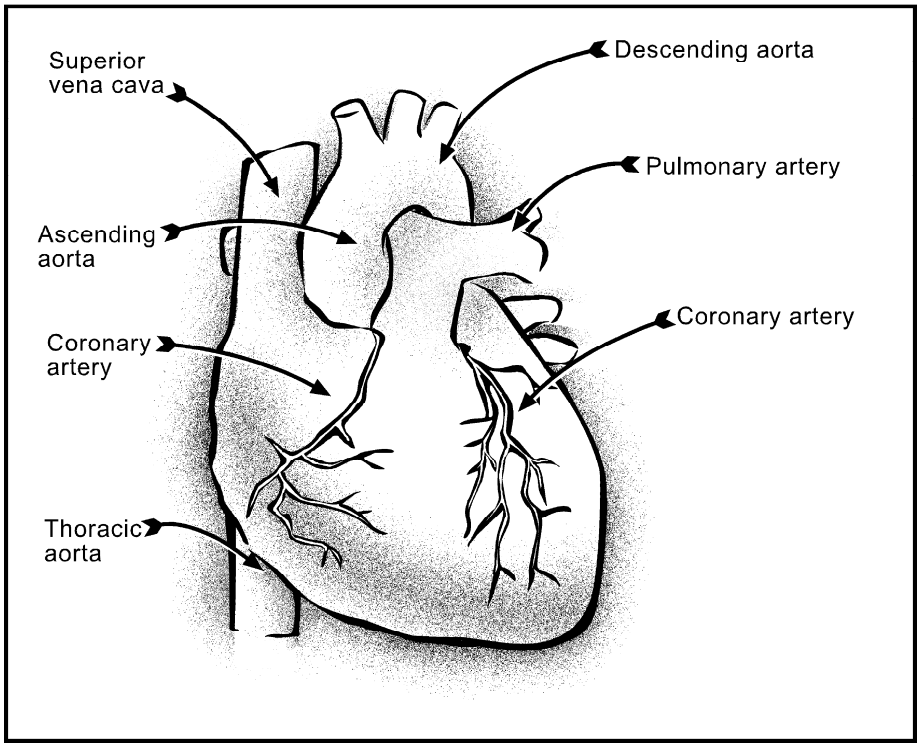
For the heart to do its work, it needs an electrical impulse to generate a heartbeat. Special cells in the heart send out electrical currents that stimulate the heart muscle and cause it to contract. Steady electrical signals are produced by your heart's "natural pacemaker," the *sinoatrial* (SA) node.

The SA node is in the upper right chamber of the heart (right atrium). The electrical signal travels through the atria to an area in the middle of the heart called the *atrioventricular* (AV) node. Special pathways then carry the signal from the AV node to all parts of both ventricles, causing them to contract. This sequence of events is called *normal sinus rhythm*, and can be recorded during an electrocardiogram (ECG).

Normally, the heart beats 60 to 80 times per minute. The surge of blood with each beat is felt as a pulse. At times, the heart's electrical system may develop a problem that prevents the electrical signals from regularly reaching the pumping chambers or that causes the signals to be delayed or erratic. Abnormal rhythms such as these are referred to as "arrhythmias."

The heart muscle needs oxygen and nutrients. The heart receives its nourishment from a system of arteries called the *coronary arteries*. They branch and divide so that the entire heart muscle is provided with oxygen-rich blood.

The right coronary artery supplies blood to the right side of the heart. The left coronary artery has 2 main branches – one extending to the front, the other to the back of the heart. Coronary artery disease (CAD) occurs when the coronary arteries become blocked, which can cause angina or heart attacks.



The arteries of the heart.

Coronary Artery Disease

Coronary artery disease (also called *coronary atherosclerosis* or *ischemic heart disease*) refers to changes or processes that occur in the coronary arteries that restrict oxygen supply to the heart muscle. This is a slowly progressive disease in which the inner layer of the artery becomes thickened and irregular, developing deposits of cholesterol and calcium.

These deposits are called *plaque*. As the plaque accumulates, the artery narrows. This process causes obstruction of the normal blood flow. A spasm in the wall of the artery may also cause the blood vessel to narrow. Narrowing or obstruction of a coronary artery from either a spasm or plaque can result in ischemia, which is a temporary decrease in the supply of oxygen-rich blood to a portion of the heart muscle.

The most common symptom of coronary artery disease is *angina pectoris*. Angina pectoris is a recurring discomfort often felt in the chest but, at times, in the neck, arms, back, or jaw. This discomfort is often described as “pressure” or “tightness,” and can vary from a mild ache to a severe crushing feeling throughout the chest.

Angina can occur during exercise, exposure to cold, after a heavy meal, with emotional stress, or with fatigue. Heart rate and blood pressure increase because the heart muscle needs more oxygen than the partially blocked coronary artery can supply. Angina usually lasts only a few minutes and is often relieved by resting, or by taking nitroglycerin. Nitroglycerin quickly expands the coronary arteries and increases the blood supply to the heart.

Chest pain that is brought on by physical exertion or emotional stress, but goes away with rest, is called *stable angina*. Chest pain that occurs at rest, lasts longer than a few minutes, or comes on with increasing or unpredictable frequency, is called *unstable angina*.

Treatment for angina includes medicines, procedures such as balloon and laser angioplasty, atherectomy, coronary stent placement, and coronary artery bypass graft (CABG) surgery.

Heart Attack

A heart attack occurs when blood supply to the heart is suddenly blocked. This results in injury to the heart muscle. This is also known as *acute coronary syndrome*.

Coronary atherosclerosis is linked with heart attacks. Atherosclerosis is a disease in which deposits of cholesterol and other fatty substances begin to line the inner walls of arteries. This is commonly called plaque. For unexplained reasons, this plaque may burst and cause a blood clot to be formed. The clot stops the blood flow, heart tissue is permanently damaged, and a heart attack results.

When you have a heart attack, part of your heart muscle dies because the supply of blood and oxygen is stopped or severely reduced. The heart muscle surrounding this area may be injured as well. Some of your heart's ability to pump effectively will be reduced in a heart attack. The more extensive the heart damage, the more loss in normal heart function.

As the damaged part of your heart heals, scar tissue forms to reinforce the area. The healing process takes about 4 to 6 weeks, but it will depend on the extent of heart injury and how fast you heal. Some people may need angioplasty, coronary stents, or coronary artery bypass graft surgery to help restore blood flow to certain areas of the heart.

During the first few days after a heart attack, your activity will be restricted while you are in the hospital. After that, activity is limited until your heart has had time to heal. After a heart attack, most people can resume their normal activities within a few weeks to months.

Some symptoms that may occur with a heart attack include:

- Pain or unexplained discomfort in the chest, jaw, shoulders, arms, or upper abdomen.
- Sweating.
- Shortness of breath.
- Nausea.
- Light-headedness.

Heart attacks can occur suddenly, and at any time or place. Most people do feel some or all symptoms of a heart attack, but one can occur with no symptoms at all.

These symptoms can be quite severe in some, or mild and/or intermittent in others. If any or all of these symptoms are present, help should be obtained right away. Minutes count and can mean the difference between life and death.

About 30% of people who have heart attacks die from them before they even reach the hospital because they delay calling for help. Early treatment can increase the chances of surviving a heart attack and can help to prevent extensive damage to the heart muscle.

When your heart is damaged, it is prone to develop abnormal heart rhythms (*arrhythmias*). The most serious of these arrhythmias is *ventricular fibrillation* (VF), in which the heart stops pumping blood. While you are in the hospital, your heart rhythm can be closely monitored, and a “shock” can be given to restore normal heart rhythm should VF occur.

There are medical treatments that can decrease the amount of permanent damage to the heart during a heart attack. In some patients, clot-dissolving medicines can be infused to restore blood flow (*thrombolytic therapy*). *Percutaneous transluminal coronary angioplasty* (PTCA) or *balloon angioplasty* can be used to increase blood flow to the affected part of the heart. Coronary stents can also be implanted to help keep the coronary arteries open. These treatments are most effective if they are used in the first hour or two. Seek medical attention right away if you experience any symptoms that may be associated with a heart attack.

Cardiac Risk Factors

Coronary heart disease (CAD) is a slowly progressive disease. Many factors have been shown to increase a person's risk of developing CAD. Controlling these factors may help slow the progress of the disease. Know these risk factors and know what you can do to keep them under control.

Risks for CAD can be grouped into 2 categories: controllable and uncontrollable.

These risks for CAD cannot be controlled:

- Family history of CAD
- Male gender

Family History/Heredity

Some people develop CAD during young adulthood. The reason for this isn't clear. If heart disease runs in your family, identify other risk factors you may have that can be controlled, such as smoking or stress. Encourage other family members to do the same, so intervention can start before problems arise.

Male Gender

Men have a higher incidence of heart disease than women. However, when women reach menopause, their incidence increases due to hormonal changes. Although many people do not realize it, heart disease is the most common cause of death in women.

These risk factors for CAD can be controlled:

- Smoking
- High blood pressure
- Elevated blood cholesterol
- Diabetes
- Stress/"Type A" personality
- Weight
- Sedentary lifestyle

Smoking

Smoking is the top risk factor for coronary artery disease for most people. It doubles a person's risk for having a heart attack and increases the risk of developing pneumonia, emphysema, lung cancer, and other respiratory diseases.

Quitting smoking is the single most important thing you can do for your heart and lungs. Recent studies show that exposure to second-hand smoke also puts non-smokers at risk for developing lung cancer and other respiratory illnesses.

When you stop smoking, your body starts to repair itself, unless there is irreversible damage. Your risk for heart disease decreases the day you quit and becomes similar to that of nonsmokers within 3 to 5 years.

Some ways smoking harms the heart:

- Reduces oxygen to the heart muscle.
- Causes narrowing and spasm of the arteries, which leads to increased blood pressure and heart rate, both of which cause the heart to work harder.
- Increases chance of blood clots.
- Negatively affects the blood cholesterol levels.

Benefits of quitting smoking:

- Decreased chance of developing heart disease, lung disease, and cancer.
- Improved sense of taste and smell.
- Increased energy level.
- Your house and clothes won't smell of smoke.
- Your teeth and hands will be cleaner.
- You will save money.

Tips to Quit Smoking

- **Resolve to give up smoking forever.** A "cold turkey" method often works best. A gradual approach is fine, as long as you don't procrastinate.
- **Set a quit date and stick to it.** Tell your family and friends about your decision.
- **Remove all cigarettes (and/or pipes, cigars), lighters, and ashtrays from your home and car.** Getting your car "detailed" will help remove the smell of smoke.
- **Develop a non-smoking environment around you.** Stay away from places or situations you associate with smoking.

- **Drink large quantities of water and fruit juice.** This helps eliminate the nicotine from your body.
- **Avoid caffeine** if drinking coffee is a habit linked to smoking.
- **If you miss the feel of having something in your hand,** hold something else such as a pencil or paper clip.
- **If you miss having something in your mouth,** try toothpicks, hard candy, carrot sticks, apples, or gum.
- **Relieve tension** by deep breathing, exercise, or taking a warm bath.
- **Save the money you would have spent on tobacco** and treat yourself to something special.
- **Most of all, don't think "just one won't hurt," because it will.**

If you would like to learn more or need help to quit smoking, programs are offered through the American Cancer Society. Call 206-283-1152 in Seattle, or toll-free 800-227-2345. Or, ask your nurse for a copy of the UWMC handout "Resources to Quit Smoking or Using Tobacco."

High Blood Pressure

As blood is pumped through the arteries, it pushes against the arterial walls. This force against the artery wall is called *blood pressure*. High blood pressure, also called *hypertension*, is a risk factor for coronary artery disease.

Your blood pressure is composed of two numbers – such as 120/80. The top number is the *systolic pressure*. It represents the pressure in your arteries after the heart has pumped a new surge of blood.

The bottom number is the *diastolic pressure*. This is the pressure in your arteries while your heart is at rest before the heart beats again. The harder it is for blood to flow through your vessels, the higher both numbers will be, and the greater the strain on your heart.

Acceptable blood pressure falls within a range. For most adults, a blood pressure reading that is less than 120/80 is considered acceptable. If you're an adult and your systolic pressure is 120 to 139, or your diastolic pressure is 80 to 89, or if both are true, then you have "prehypertension." High blood pressure is a pressure of 140 systolic or higher and/or 90 diastolic or higher, which stays high over time.

Abnormal elevation of either the systolic or diastolic pressure adds to the workload of the heart, increasing a person's risk of developing CAD. Even mild elevations can be very damaging. High blood pressure may have no symptoms, so once it has been diagnosed, it must be monitored and treated for life.

About 90% of high blood pressure has no known cause. There are many steps that can be taken to control high blood pressure:

- Control your weight.
- Quit smoking.
- Exercise regularly.
- Eat a low-sodium (low-salt) diet.
- Manage your stress.
- Have your blood pressure checked regularly.
- If your doctor has prescribed medicine for you, take it as directed.

Cholesterol

People with high cholesterol have an increased risk of developing CAD. The liver produces all the cholesterol the body needs to function. When you eat food high in cholesterol, your body gets more than it needs. When this happens, your body may build up fatty substances, known as plaque, inside your artery walls. The plaque gradually clogs the flow of blood to your heart.

Know your cholesterol level. A blood test will show your level. To get an accurate reading, you should not have anything to eat or drink (except water) for 12 hours before the blood draw.

The blood test will give a total cholesterol level. Ideally, your total cholesterol level should be less than 200. The test will also show your low density lipoprotein (LDL) and high density lipoprotein (HDL) cholesterol levels.

LDL, known as “bad” cholesterol, is thought to increase fat buildup and cholesterol inside blood vessel walls. Ideally, for people with coronary artery disease, LDL should be less than or equal to 110.

HDL, known as “good” cholesterol, is believed to remove fat and cholesterol from the bloodstream and artery walls and return them to the liver for disposal. Higher blood levels of HDL are usually found in people who exercise, maintain a healthy weight, and don’t smoke. Ideally, one’s HDL level should be greater than or equal to 40.

Treatment for elevated cholesterol levels usually starts with nutritional counseling. Reducing your total fat, saturated fat, and cholesterol intake is sensible and can help reduce your risk of heart disease.

Your cholesterol level should be checked every 1 to 3 months after dietary changes have been made. If your levels are still elevated, cholesterol-reducing medicine may be prescribed by your doctor.

Diabetes

Diabetes is a risk factor for CAD. The exact mechanism for developing coronary artery disease is not well understood. It is known, however, that having diabetes for years damages large and small blood vessels.

A person with diabetes has a much greater risk of developing heart disease if he or she also has other risk factors.

People with diabetes may be able to decrease their risk for heart disease by eating a low-fat diet, controlling their weight, and quitting smoking.

Stress/"Type A" Personality

There is strong evidence to suggest that one's personality may be a risk factor for CAD. People with "Type A" personalities may be:

- Competitive
- Time-conscious
- Impatient
- Aggressive
- Abrupt
- Highly motivated
- Tense
- Highly successful
- Reluctant to relax, due to guilt
- Always in a hurry

"Type A" personality often results in increased emotional stress and tension, which in turn causes the body to produce adrenaline. This makes the heart pump faster and harder, causing the blood vessels to clamp down or narrow. Also, tension may create high blood pressure and raise blood cholesterol during stressful periods.

Changing "Type A" Personality

Recognize your body's signals of stress – stiff, tight shoulder or neck muscles, "butterflies" in your stomach, acid stomach, etc. When you experience these signals, consciously turn them off through relaxation or imagery.

- ❑ Identify and try to reduce the things in your environment that cause you stress.
- ❑ Maintain a balance of work, play, and rest in your life.

- ❑ Engage in regular exercise – at least 3 times per week.
- ❑ Consider meditation or relaxation training.
- ❑ Set small, concrete goals. Work on 1 goal at a time.
- ❑ Avoid hurrying. Adopt a leisurely pace.
- ❑ Do 1 activity at a time and leave some time for yourself.

Learn more about relaxation and reducing stress. Classes and seminars are offered through colleges and organizations such as the American Heart Association, 206-632-6881.

Weight

Being overweight can contribute to your risk for CAD and can also contribute to other risks, including high blood pressure, diabetes, and elevated blood cholesterol. Excess weight also makes the heart work harder and may result in skeletal injuries due to stress and strain.

Achieving and maintaining an ideal weight is an important step in controlling your risks. The keys to weight control are moderation, variety, exercise, and willpower.

When losing weight, do so gradually. Long-term success depends on acquiring new and better eating habits. Eat in moderation. Include a variety of foods that contain all the necessary nutrients.

Avoid crash diets – those restricting you to fewer than 1,000 calories per day. A steady loss of 1 to 2 pounds a week is safe and more likely to be maintained. You may want to work with a dietitian to develop a calorie-restriction plan that is right for you.

Gradually increase daily physical activities. When you are ready, begin regular aerobic exercise such as walking or swimming. A long-term exercise program is crucial to weight loss and maintenance. Check with your doctor before starting any exercise program to be sure it is right for you.

Tips for Losing Weight

1. Increase physical activity.
2. Eat less fat and fatty foods.
3. Eat less sugar and sweets.
4. Avoid alcohol.

Reward yourself for weight loss with items other than food. New clothes, a movie, or a trip are a few suggestions.

Sedentary Lifestyle

A sedentary lifestyle is one in which a person gets little or no physical activity in his or her work or leisure time. Such people are more likely to suffer angina and have a heart attack if they also have other risk factors. Regular, sustained exercise can help decrease the workload on your heart. As your body becomes conditioned, your heart will perform more effectively. Other benefits include:

- Improved circulation.
- Enhanced join mobility and muscle tone.
- Increased strength and endurance.
- Improved blood cholesterol levels.
- Weight loss.
- Improved blood pressure.
- Greater ability to handle stress.
- Release of tension.
- Improved feeling of well-being.
- Decreased stress/depression.

Regular exercise generally means performing an activity for 20 to 30 minutes, 3 to 4 times per week. Talk with your doctor about your exercise program and gradually work up to the recommended exercise level.

Alcohol and Your Heart

Many people wonder if drinking alcohol is safe for those with heart disease. Alcohol can have varying effects on the heart, depending on your specific problem. It is best to direct any questions you may have about drinking to your doctor.

Excessive alcohol intake has been shown to cause increased risk of hypertension, stroke, cancer, and cirrhosis of the liver. It can also damage the heart muscle, causing conduction defects that lead to arrhythmias (disruptions in the normal, regular heartbeat).

Alcohol will increase your heart rate and slightly decrease the strength of your heart muscle’s contraction. This is why you should avoid exercise or other strenuous activity after drinking.

Cardiac Tests

Cardiac Catheterization (Coronary Angiography)

Description: This test is used to check the coronary arteries, which supply blood to the heart muscle. A catheter (narrow tube) is inserted into an artery in the groin or arm, and is carefully guided to the heart with the use of a fluoroscope (X-ray machine). Contrast dye is injected through the catheter into the coronary arteries and their images are recorded on film. These images show the arteries that are narrowed or blocked.

Takes About: 1 to 3 hours. Requires special instructions as well as your written consent.

Place Done: Cardiac Cath Lab.

Coronary Computed Tomography Angiogram (Coronary CTA)

Description: This procedure studies the inside of your tiny heart vessels without physically going inside your heart. The computer tomography (CT) scanner can scan the entire heart during only 5 beats. A radiologist and a technologist will give you a non-toxic contrast through an IV into your vein. When the contrast reaches your heart vessels, the CT scanner takes thousands of pictures in a very short time. The images are then pieced together and the radiologist is able to evaluate them for blockage of an artery.

Takes About: 30 minutes.

Place Done: Radiology.

Electrocardiogram (ECG, EKG, 12 Lead)

Description: An ECG is a recording of your heart's electrical function. Electrode patches are attached to each wrist and ankle, and at six points on your chest. A recording is then made, giving your doctor 12 views of your heart's electrical activity. This way, your doctor can tell if the heart is experiencing any irregularities, stress, or damage.

Takes About: 5 to 10 minutes. Requires no special preparation.

Place Done: Bedside or Regional Heart Center.

Echocardiogram (Echo, Cardiac Ultrasound)

Description: Images of the heart are produced by using sound waves generated from a small device (transducer) held to your chest. The sound waves are bounced off the heart structures and sent back to a screen, where they are recorded on film. These images help to identify abnormalities of the heart muscle or heart valves, and to detect the presence of fluid around the heart.

Takes About: 30 minutes to 1 hour.

Place Done: Bedside or Regional Heart Center.

Electrophysiology Study (EP Study, EPS)

Description: This test is used to provide more precise information about the electrical function of your heart, and is performed by a specially trained cardiologist. A catheter (narrow tube) is inserted into an artery in the groin and carefully guided to the heart using a fluoroscope (X-ray machine). Once the catheter is in place, measurements of your heart's electrical activity will begin.

Takes About: 2 to 4 hours. Special instructions are required before and after this procedure, as well as your written consent.

Place Done: EP Lab, 2nd floor.

Holter Monitor (Ambulatory Monitor)

Description: This device records your heart's electrical activity over a period of time, and may be worn at home or in the hospital. Electrode patches are placed on your chest, with wires going to a small recorder (about the size of a small, portable tape recorder), which is worn with a shoulder or belt strap.

Takes About: You will be asked to keep a diary of daily activities, symptoms, and medicines taken during the recording period so that any abnormal rhythms found can be related to particular activities.

Place Done: Regional Heart Center.

Magnetic Resonance Imaging (MRI) Cardiac Scan

Description: This scan uses radio waves and a strong magnetic field instead of X-rays to provide clear detailed pictures of the heart. An MRI exam typically consists of 2 to 6 sequences of pictures, each lasting 2 to 15 minutes. Each sequence shows a cross-section of the heart.

Takes About: 30 minutes to 1 hour.

Place Done: Radiology.

Radionuclide Ventriculogram (RNVG), Multi-gated Analysis (MUGA), Cardiac Nuclear Medicine Exam

Description: These tests provide information about the pumping ability of your heart. A very small amount of radioactive material is injected into a vein. A special camera records the movement of the radioactive material through your heart with each heartbeat.

Takes About: 1 to 2 hours.

Place Done: Nuclear Medicine Department.

Pulmonary Function Test (PFT)

Description: This test is used to measure lung function. You will be asked to breathe in and out several times into a machine.

Takes About: 30 to 45 minutes.

Place Done: Pulmonary Function Lab.

Telemetry Monitoring

Description: By using radio signals, your heart's electrical activity is sent to a heart monitor at the nurses' station and sometimes into your room. Electrode patches placed on your chest are connected to a small battery-powered telemetry box (about the size of a transistor radio). This device, which is carried in a pouch around the neck or in a pocket, makes it possible to monitor your heart rhythm continuously while you gradually increase your activity.

Takes About: Taken continuously while hospitalized.

Place Done: Bedside.

Stress Tests

Stress tests are performed to diagnose coronary artery disease or angina. These are the types used most often:

Exercise Tolerance Test (ETT, Treadmill)

Description: This test is done to determine your exercise tolerance and any abnormal heart rhythms and/or inadequate blood blow to your heart during exercise. Electrode patches are placed on your chest and connected to a treadmill electrocardiogram (ECG) computer, which will record electrical signals from your heart during exercise. While you are walking and/or running on a treadmill, your ECG, blood pressure, and pulse are recorded.

Takes About: 45 minutes to 1 hour.

Place Done: Regional Heart Center.

Thallium Stress Test, Sestamibi Stress Tests, Persantine/Adenosine, Dobutamine Stress Test

Description: These tests compare the amount of blood flowing through the heart muscle during stress and at rest. Thallium and sestamibi stress tests involve walking and/or running on a treadmill. Persantine and dobutamine stress tests involve causing stress on the heart by giving one of the 2 medicines named, not by actual physical exercise. Both types of stress tests use radioactive scans to detect the presence and extent of coronary artery disease. Pictures of your heart will be taken about ½ to 1 hour after injection of a very small amount of radioactive materials while you are at rest, and again during exercise or medicine-induced stress. The exercise portion of the study may be done first.

Takes About: The scanning time (picture-taking) for all these procedures takes about ½ hour. The entire test can be completed over 1 to 2 days, and may require special instructions.

Place Done: Nuclear Medicine Department.

Stress Echocardiography Test (Exercise Echo, Dobutamine Echo)

Description: This test checks the function of the heart muscle at rest and under stress. When blood flow to the heart muscle is reduced, the motion of the heart muscle changes. These changes can be detected using echocardiography (see Echocardiogram). This test begins as an exercise tolerance test, either with actual physical exercise or intravenous (IV) administration of the medicine dobutamine to stress the heart muscle. Images of the heart will be recorded by the echocardiography technician before and after the stress portion of the test.

Takes About: 1½ hours.

Place Done: Regional Heart Center.

Resources to Learn More

There are many heart-healthy books that can help you increase physical activity, reduce stress, manage your weight, and improve your overall health. You can borrow them from the library, or buy them from a traditional or online bookseller.

Ask your provider to recommend specific books, as well as Web sites that may be helpful.

Books

Eating/Cooking/Weight Loss

There are many excellent cookbooks and magazines about cooking light and eating well. Try titles by the American Heart Association, Dean Ornish, Joseph Piscatella, and Brenda Ponichtera. There are also many excellent resources listed in the UWMC publication *Heart Healthy Nutrition*.

Emotional Aspects

- *The Healing Heart* by Norman Cousins
- *Transitions: Making Sense of Life's Changes* by William Bridges

Exercise

- *Burning Fat, Getting Fit: Exercise and Your Heart, A Guide to Physical Activity* by the American Heart Association
- *Fitting in Fitness* by the American Heart Association

Sexuality

- *Heart Illness and Intimacy* by Wayne Sotile
- *The Sensuous Heart: Guidelines for Sex After a Heart Attack or Heart Surgery* by Suzanne Cambre

Questions?

Call 206-598-4300

Your questions are important. Call your doctor or health care provider if you have questions or concerns. UWMC clinic staff are also available to help at any time.

Regional Heart Center/Cardiovascular Clinic: 206-598-4300

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Stress Management

- *Don't Sweat the Small Stuff* (any in the series) by Richard Carlson
- *The Relaxation Process* by Herbert Benson
- *The Relaxation and Stress Process* by Martha Davis, et. al.

Web Sites

American Heart Association
www.americanheart.org
This site provides links to dozens of other well-respected sites including extensive listings for government agencies, universities and research centers, scientific organizations, and other resources.

Harvard Heart Letter
www.health.harvard.edu
Recommended by UWMC clinicians, this site offers detailed information about many aspects of heart disease, rehabilitation, and a heart-healthy lifestyle. Click under "Newsletters" and then "Harvard Heart Letter."

UNIVERSITY OF WASHINGTON
MEDICAL CENTER
UW Medicine

Regional Heart Center
Box 356087
1959 NE Pacific St. Seattle, WA 98195
206-598-4300

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