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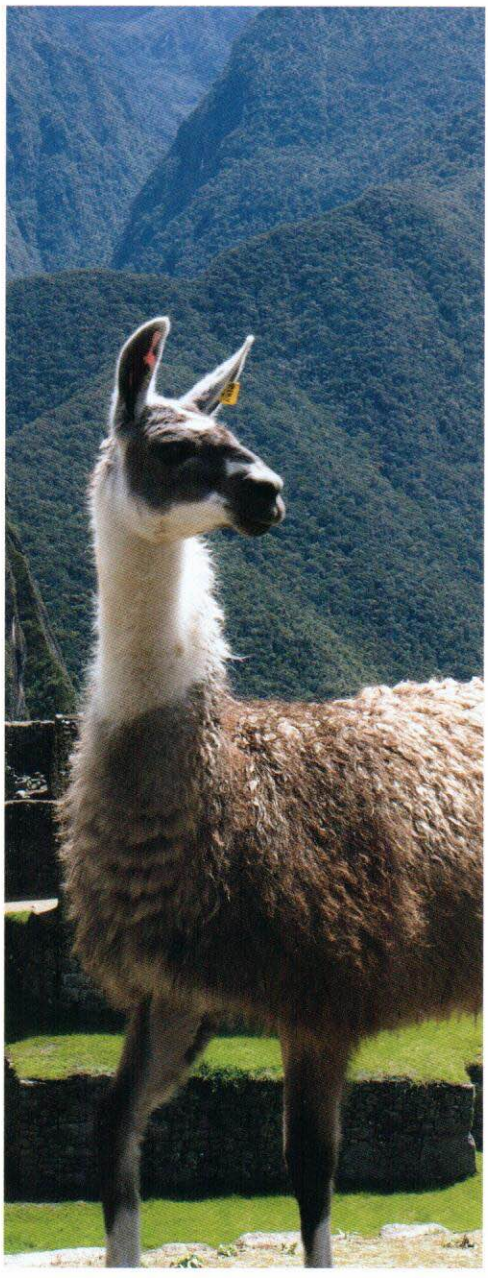

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1. 腎石 - 何時才需要開刀？(上)
Surgical Management of Urinary Stones

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Abstract

More than a million kidney stones are diagnosed in the United States each year. 1 in 10 Americans will suffer from a kidney stone during their lifetime. This accounts for 7-10 hospital visits per 1,000 admissions. The incidence of stone disease may be increasing because of dietary and climate changes. It is more prevalent in ages 35-45. In this article, the symptoms of kidney stones , how kidney stone are diagnosed, what are the compositions of stones are discussed. Base on the stone size, location, composition, and number of stones, the appropriate treatment can be determined.

In general, you will likely need surgery if your stones are large enough to block urine flow, if they are potentially harmful to your kidneys, or if they are causing infection or symptoms not treatable with medication.

The 3 primary surgical treatments include: (1) Shock Wave Lithotripsy (ESWL) (2) Ureteroscopy (URS) and laser lithotripsy and (3) Percutaneous Nephrolithotomy (PCNL). The risks and potential complications are also discussed.

在美國,每年有超過100萬人被診斷患腎結石。在每10個美國人中,就有一個經歷過患腎結石的痛苦。在每1000名需入醫院留醫的個案，有7-10個是腎結石患者。隨著飲食和氣候的改變,結石病的發生率似乎在增加。從35歲至45歲的年齡，發病率較高。

腎結石的症狀是什麼？

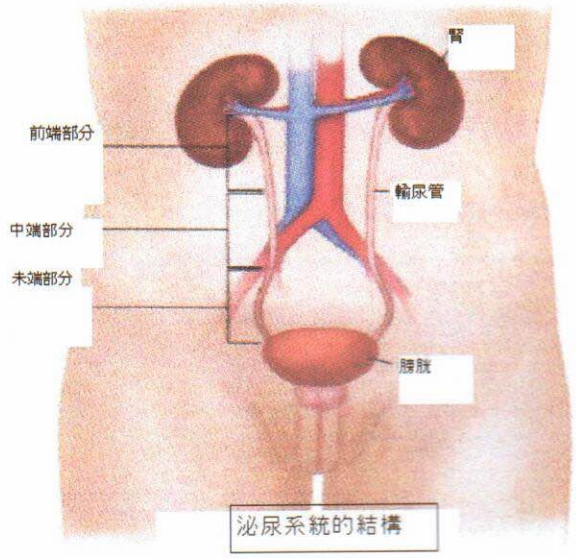
當結石在輸尿管中形成之後,隨著時間,他們會繼續長大和改變他們的位置。在腎中形成的結石被稱為腎結石，輸尿管結石是結石在腎臟中形成之後移動到輸尿管的。輸尿管把尿液從腎臟輸送到膀胱。當結石堵住尿液從腎臟流向膀胱，導致腎臟擴張，患者就會出現症狀。最普遍的症狀，是在側腎出現突發性的絞痛，這種痛通常擴散至前腹部和腹股溝。這種疼痛被形容為刺痛和絞痛，甚至比生產的疼痛更為劇烈。同時，病人還可能會有噁心,嘔吐和血尿的症狀。有些病人，尤其是糖尿病患者因為結石堵塞尿液引致感染，可能會發燒。這種情況下病人需要緊急導尿以防止出現更嚴重的疾病.

有時，小的腎結石的癥狀可能是一暗痛，與肌肉痛和腸痛相似。間中沉默的腎結石沒有癥狀，但會對腎構成不可康複的損傷。

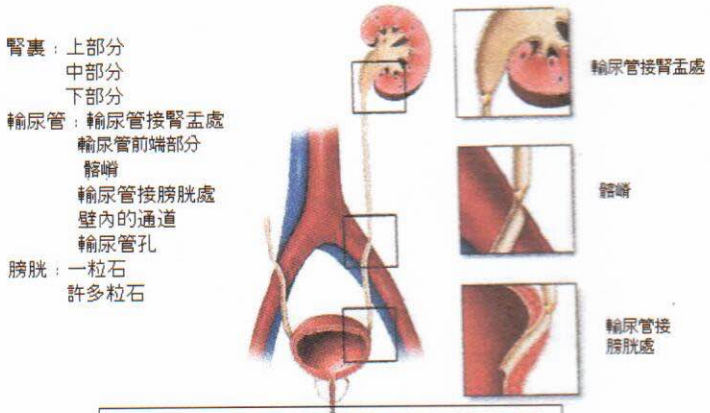
怎樣診斷腎結石？

當懷疑有尿路結石的時候,我們需要做以下的檢查:

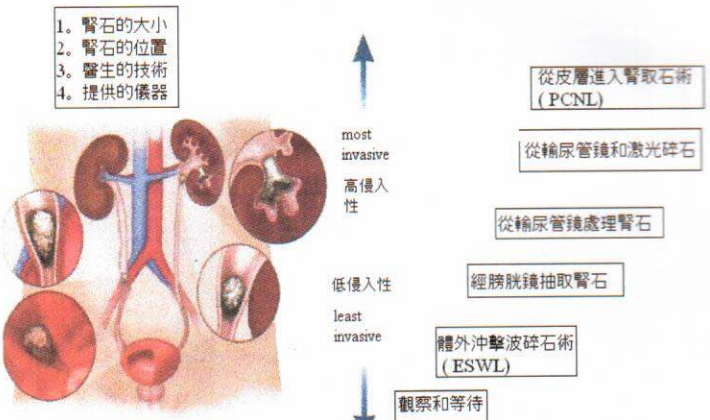
* 血液檢查 - 檢查腎功能和排除感染。
* 尿液檢查 - 尿常規和尿培養來確認是否有感染。
* 腹部X光檢查 - 來確認腎中和輸尿管有沒有鈣化位置如果結石是鈣化的。
* CT 掃描 - 這是診斷結石的最準確的檢查。可以檢測到各種不同類型的尿結石。



泌尿系統的結構



腎石在泌尿系統可能發生的位置



處理腎石需考慮的因素和處理的方法

腎石可根據其構造，如下表分為四類 。

腎石的種類，成因和發病率		
腎石的種類	成因	不同種類的腎石比率
鈣 (calcium) 石	約一半的鈣石是混合了草酸鈣和磷酸鈣的。一水草酸鈣 （ calcium monohydrate oxalate ）石是密度最高的石。是最難擊碎的。	鈣 (calcium)75% - 85% 草酸鈣 (calcium oxalate) 65% 磷酸鈣 (calcium phosphate) 5%
鳥糞 (struvite) 石	這些石是透明與磷酸鈣合成的。雖然它們很易碎，但有此種石的病人通常是用穿刺皮碎石術(percutaneous fragmentation)來抽出碎石的。因這類石多較大和常有感染情況。	10 % - 20 %
尿酸 (uric acid)石	這些細和滑的石通常在X光檢查透光（令它不顯現）但在CT 檢查則不透光(即可顯現)。易生此種石的成因包括尿較酸性，尿中尿酸過高，小腸毛病或做過小腸切除手術，痛風病或細胞分解 (例如治療白血病或因饑餓引起的)	5% - 10 %
胱氨酸 （cystine） 石	這些像不透明玻璃的腎石是因尿裏過多胱氨酸所引起的。這是一隱性染色體代謝缺陷遺傳病。這種石比其他石稍透明和不易碎，特別是表面光滑的石。	1%

有那幾種腎結石手術供我們選擇呢？

一旦結石的大小,位置,構造和結石的數目通過上述檢查確認後,我們就可以決定合適的治療方法。做腎結石手術的首要目的是用最少傷害，盡量低成本和容易康復的方法把腎石拿出。通常來說，如果結石很大，造成尿路堵塞；有可能損害你的腎臟，或者已有感染或導致不能用藥物治癒的症狀，你就需要手術治療。

有三種主要的手術方法包括:

1. 衝擊波碎石術 (extracorporeal shock wave lithotripsy) (ESWL)
2. 輸尿管鏡 (ureteroscopy) (URS) 和激光碎石術 (laser lithotripsy)
3. 經皮腎鏡取石術 (percutaneous nephrolithotomy) (PCNL)

至於這三種手術究竟是怎樣做法的。因本期編幅所限，將在第39期詳細，圖文並茂向各讀者解釋。

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2. 怎樣評估和預防腎結石？

Practical Approach to the Assessment and Manage ment of Kidney Stone Prevention

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Abstract

Kidney stones are a common occurrence in North America. This article reviews the epidemiology, clinical assessment and stone prevention for calcium oxalate stone and uric acid stones. The 8 modifiable risk factors (urine volume, sodium intake, urine calcium, urine citrate, urine magnesium , urine oxalate and urine uric acid levels and blood calcium level) that can decrease the risk of stone formation will also be discussed. For patients with recurrent stone formation, annual follow up with repeat 24 hour urine collections are recommended. This helps to ensure the effectiveness of the treatment and the optimization of the urine biochemistry.

腎結石相當普遍。2002年，在台灣的患病率為9.6%，在韓國為5.0%，在美國則為5.2%。本文將檢討兩種最常見的腎石，即草酸鈣 (calcium oxalate)石和尿酸 (uric acid) 石的發病資料、臨牀評估和怎樣預防這類腎石的產生。至於怎樣評估及治療急性腎絞痛則不是本文的討論範圍。

發病因素

族裔和人種因素與腎石的患病率有關。白種男性的患病率最高而非洲裔女性的患病率則最低。亞洲裔和拉美裔病人的患病率則在二者之間。

患病率亦隨年齡變化而變動。就白種男性而言，20歲後，發病率開始增加。高峰期在40至60歲之間，隨後下降。就女性而言，發病率到了20歲末期達到高峰期，到50歲開始下降，然後保持不動。

復發率

病人患過一次腎結石之後，他們每年的復發率為2-5%。美國泌尿科協會(American Urological Association) 2014年腎石處理指引建議（B級），所有重復患腎石者須從檢查化學元素指數方面進行檢查。

腎石的類型

腎石可從其主要的成份，分為四類：草酸鹽鈣 (calcium oxalate) 石，尿酸 (uric acid) 石，鳥糞(磷酸銨鎂) (magnesium ammonium phosphate) 石和半胱氨酸 (cysteine) 石。後兩種較罕見，本文將集中討論前兩種最常見的類型：草酸鈣石和尿酸石。

大約80%的腎石為鈣石，其中90% 為草酸鈣，其餘10%為磷酸鈣 (calcium phosphate) 。15%的腎石為尿酸石，但是視乎地理氣候而定，有時也可高達至40%。如氣候炎熱，影響到尿量下降，導致尿的pH值降低，而增加尿酸石機會。偶然病人會有不同類型腎石(例如：草酸鈣和尿酸) 同時 出現的情況。

風險因素

我們可以量度以下8種可以改進的風險因素，來減少形成腎石的風險。

1. 低排尿量

一個為期5年的有計劃的隨機抽樣研究顯示：低尿量(即每24小時尿量少於2升)是增加腎石復發率的一個風險因素。飲用較多水份的病人在5年內的復發率為12%，相比沒有增加攝入液體量者的復發率為27%(p=0.008)。這數據可解釋為，增加水份，5年內復發的風險，減少了15%。再加上，尿量較低的病人每次產生腎石與上次相隔的時間也較短：高尿量一組相隔39個月，而低尿量一組相隔25個月(p=0.016)。因此，從多喝水來增加尿量是減少腎石復發風險的最有效的辦法。

因此，建議有腎石的病人，無論腎石屬何類型，增加其液體攝取量，目標為每24小時排出尿量超過2.5升(litres)。即每日需攝取約3升液體，但此攝取量會因應氣候和周圍的温度、在腸胃裏液體的流失以及其他不能量度的流失而調整。通常醫生會安排病人收集24小時小便來量度其一天的排尿量，這數目跟2.5升的差額便是病人每天需要比平常多喝的份量去達到該目標。例如，如果病人24小時排尿只有1.5升，如想要有2.5升排尿量，醫生會建議病人多喝1升液體。

至於飲甚麼液體這問題，以水最佳。在水中加青檸(lime)或檸檬汁可以作為檸檬酸(citrate)的來源也有幫助。然而，最好避免飲紅茶，綠茶，可樂，姜啤，咖啡，蘋果汁以及西柚汁，原因是它們的草酸鹽(oxalate)含量高。

2. 高納 (sodium) 攝入量

高鈉(主要由鹽中攝入) 飲食會增加在尿中排出的鈣。每日攝取的納不應超過2.5-3克(gm)。消費者應仔細閱讀食物標簽顯示食物的納量，避免加工食物，罐頭和冷凍食物，和在外或酒家等製備的食物。進行一次收集24小時小便可顯露病人每日鈉的攝取量，目標是每日在尿中鈉的含量最好不超過150mmol (毫摩爾) 。

3. 高尿鈣

隨著每天尿中排出的鈣增加至超過2.5mmol的話，有腎結石的機會也會相繼增加，雖然通常尿鈣排泄每日少於7.5mmol是被認為屬於正常範圍之內。引致高尿鈣症的因素，包括可能是副甲狀腺(hyperparathyroidism)機能亢進，酸血症(即腎小管酸中毒) (renal tubular acidosis)，但大多數是自發性的。

作為開始檢查腎石的初部測試應包括，量度病人的副甲狀腺激素指標、25-羥基維生素D和1,25-羥基維生素D水平、血清和尿中鈣的成份、血磷(phosphate)水平。

要控制高尿鈣，病人應將每天的鈣攝入量限制於900毫克以下(即大約3份進食量)，同時還要注意減低鈉和草酸鹽的攝入量。如果飲食方面作出改變還不足夠，則可開始藥物治療，服用噻嗪類利尿藥(thiazide diuretics)，以增加遠端腎小管(distal tubular)的鈣的反回吸收(resorption)，來減少鈣的排泄。

腎磷酸鹽虛耗(renal phosphate wasting)與高尿鈣症有關連，因為血的磷酸鹽低導致維生素D活化，並促進腸對鈣的吸收。在這種情況下，服用磷酸鹽作為補充劑，以矯正血低磷水平是有幫助的。

4. 低尿檸檬酸鹽 (Citrate)

檸檬酸的排泄對預防鈣腎結石很重要，因為檸檬酸提高草酸鈣(Calcium Oxalate)在尿中的溶解度，從而防止腎石的形成。患有腎小管過酸 (renal tubular acidosis)者或慢性腹瀉的病人，他們的檸檬酸會是低的。如病人的24 小時尿量顯示每日排出的檸檬酸鹽低於1.6 mmol的話，病人可在水中加檸檬汁或青檸汁來補充檸檬酸鹽。如果這樣做仍不能成功矯正尿檸檬酸過低，可加上口服檸檬酸鉀 (potassium citrate)。

5. 低尿鎂 (Magnesium)

鎂同檸檬酸一樣，也能增加草酸鈣在尿中的溶解度，從而防止腎石的形成。如病人的24小時尿內的尿鎂每日低於3mmol，便有需要開始每日服用400毫克鎂的補充劑。不過，服用鎂補充劑後最重要的是要觀察有沒有腹瀉。這是口服鎂補充劑的一個可能出現的副作用，腹瀉可能增加腎結石的風險的。

6. 高尿草酸鹽 (oxalate)

高尿草酸鹽會增加腎結石的風險。輕度的高尿草酸鹽主要是由於吃了過多含高草酸鹽的食物，如菠菜，馬鈴薯，甜菜根(beets)，大黃(rhubarb)，白羅蔔(turnip)，果仁和朱古力。限制攝入含高草酸鹽食物是治療此情況的關鍵。

病人患腸胃病如炎性腸病，做了腸縮短手術(bowel shortening surgery)者以及胰功能不全者可能在他們的腸內出現鈣皂化(saponification)作用。這情況導致過份誤吸收的脂肪酸，脂肪酸捆綁了小腸內的鈣形成從腸內吸收的草酸鹽增多，以致出現高尿草酸鹽(hyperoxalaturia)。服用檸檬酸鈣和消膽胺(cholestyramine) 對處理這些情況可能有幫助。

原發性高草酸鹽症(hyperoxaluria)是一罕見的常染色體隱性 autosomal recessive 病，在乙醛酸鹽(glyoxylate)代謝中出現酶缺損情況，導致增強了產生草酸鹽。多出的草酸鹽由腎中排出，導致高尿草酸鹽。這能引致草酸鈣石和腎鈣化，從而導致末期腎衰竭。在腎絲球過濾率低於30-40毫升/分鐘(ml/min)的慢性腎病情況，當腎不能維持適當的排泄廢物的速度，血草酸鹽水平便會開始上升。在這一階段，系統裏的草酸鹽開始沉澱在其他主要器官，引致系統性草酸鹽症的癥狀。治療方法包括服用高劑量的吡哆醇pyridoxine(維生素B6)，攝取大量液體，服用檸檬酸和鎂補充劑，飲食方面要限制草酸鹽。但是，唯一可以肯定的治療方法是移植肝，因為捐贈的肝會提供失去了的酶。

7.有血尿酸過多或無血尿酸過多的尿中高尿酸 (uric acid)

尿酸的沉澱由液體中的酸鹼pH值決定。如病人有尿中高酸尿症，除了要限制每日攝取蛋白質4-6安士之外，用檸檬酸鉀 (potassium citrate) 補充劑將尿的pH值鹼化到8，提高尿酸石的溶解度，而減少腎石的形成。如尿已足夠地鹼化但腎石仍繼續產生，特別是患有高血尿酸症的病人，可以使用黃嘌呤氧化酶抑制劑(xanthine oxidase inhibitors)，即別嘌醇(allopurnol)，或febuxostat。

8. 高血鈣症

由原發性(primary)副甲狀腺功能亢進或結節病(sarcoidosis)引致的高血鈣症能引致腎石病。作為評估腎結石的初步檢查，量度副甲狀旁腺激素、25-羥基維生素D和1,25-羥基維生素D水平、血鈣和尿鈣水平及血磷水平至為重要。對產生高血鈣症的本因進行治療，應該可以降低形成腎石的風險。

總括來說，在北美，患腎結石非常普遍。無論如何，從改變這8個高危因素可減低形成腎石的風險。復發患者應每年重複檢查24小時小便來察看治療的效果和觀察小便裏的化學成份。如讀者有任何疑問，請向自己醫生查詢。

3. 治療二型糖尿病新藥

A New Option in the Treatment of Type 2 Diabetes

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Dr. Hannah Toong MD

Abstract

Controlling blood sugars is essential for reducing the risk of developing complications of diabetes. To do so, one needs to incorporate proper food choices, physical activity and medications. There are many choices of medications available with different advantages and disadvantages. The newest class of medications for lowering blood sugar became available in Canada in June 2014 – SGLT2 inhibitors. To explain how they work, first we need to understand how the kidneys affect blood sugars.

The kidneys' role in our body is to filter blood and allow non-essential nutrients to exit through the urine. In an average day, the kidneys filter 180 grams of sugar but there needs to be a way to bring all of that sugar back into our blood so that we do not lose this essential source of energy through the urine. SGLT2 stands for sodium-glucose linked transporter (co-transporter) and they exist within the kidneys to bring sugar back into the blood so that sugar is not lost in the urine. If the SGLT2 are blocked, then sugar will be allowed to exit the body through the urine, thereby lowering the sugar level in the blood. The SGLT2 inhibitors were created to do just that.

By allowing sugar to exit through the urine, the average blood sugar is reduced. However, it will not be reduced below normal because when there is less sugar in the blood, there will be less sugar spilled into the urine. Therefore, there is very low risk of hypoglycemia when taking these medications. In addition, losing sugar in the urine is another way to lose calories so there may be weight loss with the use of these medications. Also, these medications can help lower blood pressure by acting as a weak diuretic.

As with all medications though, there are potential side effects. Given that the urine will contain sugar, there is a slightly increased risk of yeast infections and urinary tract infections, more so in women than in men. As well, there is a risk of getting dehydrated so it is important to select the right patient. Finally, these medications are most effective in people who have adequately functioning kidneys so there are limitations with respect to the level of kidney function.

At this time, there are two SGLT2 inhibitors available in Canada – dapagliflozin (Forxiga) and canagliflozin. Both drugs are once daily oral medications that can be combined with other diabetes medications, including insulin. To start the medication, the kidney function level should be greater than 60 mL/min and caution is needed in people that are over 75 years of age or using certain diuretics.

To summarize, SGLT2 inhibitors are a new class of medications to help lower blood sugar and treat type 2 diabetes. These oral medications effectively lower blood sugar (but not too much), may lower weight and can lower blood pressure. The potential side effects are yeast infections, urinary tract infections and dehydration. In patients with adequate kidney function, this class of medication can be a good addition to other treatments to effectively control blood sugar and reduce the risk of future complications.

控制血糖是減少糖尿病者發展併發症最重要的方法，要降血糖要三管齊下:

（1）選擇適當的食物
（2）增加體力活動
（3）藥物

如今有很多類的藥物可以選擇，每種藥物有其優點也有缺點。於2014年6月在加拿大有一種最新降血糖藥面世，叫SGLT2抑制劑。要理解這個藥的功用首先要明白腎臟及血糖的關係。

腎臟的主要功能仍是過濾身體血液，然後將廢物從小便排出。每天腎臟要過濾180克糖份到尿中，但在腎臟內要將這些糖份吸收回身體，免得身體從小便中失去重要能量。SGLT2是Sodium glucose linked transporter (co-transporter) 的縮寫，全名是納及葡萄糖共用的輸送工具。這種物質在腎臟內主要功用是將過濾出去的糖份吸收回身體，免得流失於小便中。如果SGLT2被這個新藥抑制住，那麼糖份不會吸收回而在小便中排出，為此可降低血糖。SGLT2抑制劑的目的就在此。

允許糖份由小便排出而降低血糖，但是不會將血糖降得太低，因為血中糖份低時糖份過濾到小便中也少，所以小便排出糖份也少，因為糖份從小便排出無形中降低能量，導致體重下降（減肥胖）。加上這種藥有輕微的利尿作用所以也幫助降血壓。

所有的藥物都有副作用，因小便中含有糖就會增加霉菌的感染及尿道炎，這一點女性比男性多一點，還會引起脫水，為此選擇合適的病人要慎重。這種效果最好是在腎功能正常者。另外注意腎功能不正常不能用。

市面上有兩種SGLT2抑制劑：dapagliflozin (Forxiga)和canagliflozin。這種藥物可以與其他糖尿藥一起服用，包括胰島素。用這種藥物患者其腎絲球過濾率 glomerular filtration rate（GFR）要超過每分鐘排60mL的小便，如病者超過75歲或有用其他利尿藥者要慎用。

總結：SGLT2抑制劑是一種新的降血糖藥用於治療二型糖尿病。這種口服降血糖的藥可降血糖（但不會太多），可以幫助減輕體重和幫助降血壓。其副作用可能引起霉菌的感染、尿道炎及脫水。對於腎功能正常的病人這類藥帶來好的機會，配合其他治療以致有效的控制血糖導致降低併發症的危機。

4. 治療乙型肝炎藥物資助計劃 HepSTART Program

資料來源：Gilead HepSTART 計劃
編譯：肖小燕 藥劑師 *Ms XiaoYan Xiao, BSc Pharm*
傅永安 藥劑師 *Mr. Benjamin Fu, BSc Pharm*

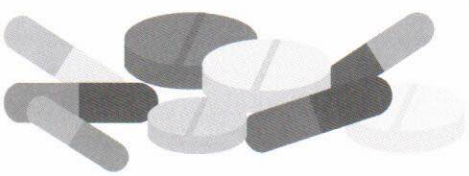
替諾福韋Tenofovir(Viread)是用於醫治慢性乙型肝炎感染者的藥物。可抑制乙肝病毒活動，防止或減輕肝癌形成的風險，這藥十分昂貴每年大概需要七千多元。如果你需要服這種藥，你可以申請私人保險，政府延齡藥物計劃 (Trillium Drug Program)及HepSTART (肝炎藥物資助計劃)。

1. 如何申請Hepstart(肝計劃)？

醫生會給你申請表,申請表會問你有沒有申請政府藥物保險如延齡藥物計劃，安省政府耆老藥物計劃，有沒有雇主藥物保險，有沒有私人藥物保險，需不需要肝計劃報銷資助，政府是否已批准你服用這種藥及你需不需要肝計劃職員幫你申請政府藥物保險等，簽名後請傳真去 HepSTART 計劃 1-866-552-0646

2. 肝計劃何時開始？

收到申請表後，職員會在24小時內聯絡你，如果三次都找不到你，肝計劃會通知醫生請你直接聯絡肝計劃的職員，如果你沒有私人或雇主保險，又沒有政府藥物計劃，職員會幫你申請延齡計劃或請醫生幫你向政府申請批准你服用這藥。延齡計劃是根據你家庭的總收入而定出每年你要付的墊底費當。肝計劃知道你每年的墊底費後，它便會批准資助這墊底費，肝計劃會寄一封確認信通知病人計劃什麼時候開始資助這藥。



3. 肝計劃批准後，如何去取回付出的藥費？

你可以傳真你配藥的付錢收條去肝計劃1-866-552-0646，職員會直接寄支票給你，每年至多$1,200，由計劃批准的日期開始。如果超過$1,200便要自付。

4. 如果我沒有錢先付墊底費，應該怎樣？

你可以和你的藥房商量不收你的墊底費，該藥房要向肝計劃申請你服藥的墊底費直接寄回藥房。批准後你便可以到該藥房取藥，藥房會記錄你每次的墊底費，如果一年多過$1,200您便要付餘下的費用。

5. 大概多長時間我會收到已付的墊底費？

大約四至六個星期肝計劃會寄回您的墊底費。如果六星期都沒收到，請直接致電肝計劃1-866-949-9920查詢。如果你對肝計劃有任何不明白的地方，你都可以致電以上號碼，有廣東話或國語職員為您解答問題。

5. 治療乙型肝炎指引
Guidelines on Hepatitis B Management

資料來源：Gilead 藥廠
編譯：編譯組

Abstract

Among south Asian , hepatitis B is a very common disease. In Ontario, most physicians would screen all patients to see if they have this condition if indicated. The diagnostic tests to identify if a patient has ever been in contact with this condition are HepBsAg, Anti-HBs and Anti-HBc. If a person is HepBsAg positive, then by definition, that patient has contacted the disease. If this test remains positive after six months, then he/she would be identified as a hepatitis B carrier.

Once identified as a hepatitis B carrier, the recommendation is a physical examination and various laboratory tests be performed every 6 months to monitor the condition. The recommended laboratory tests include HepBsAg, HepBeAg, Anti-HBe, Anti-HBs, HBVDNA, platelets, AST, ALT, bilirubin, albumin , creatinine, prothrombin time /INR and an ultrasound of the abdomen or even a CT of the liver if indicated. Other tests used to assess liver fibrosis are Fibroscan, fibrotest and liver biopsy.

The periodic surveillance helps the doctor to identify which patients should be started on treatment. Doctors recommend treatment based on HepBeAg status, Anti-HBe status, ALT level and HBVDNA level. If treatment is not indicated based on these parameters, physicians would assess for liver fibrosis with either a liver biopsy or doing a Fibroscan or Fibrotest. If fibrosis is detected, treatment would be initiated. The objective of treatment is to prevent the development of cirrhosis and its consequences, liver failure and hepatocellular cancer (HCC).

Canadian consensus guidelines recommend tenofovir (Viread) as a first-line treatment option for the management of chronic hepatitis B in treatment-naïve and lamivudine-resistant patients. It is given in a 300 mg once daily dosing. It has demonstrated powerful viral suppression maintained at 240 weeks (HBV DNA <400 copies/ml) with close to 0% resistance mutations. Studies have shown that the fibrosis score improved after treatment. It has demonstrated regression of cirrhosis in 73% of cirrhotic patients with an excellent safety profile.

In the treatment of chronic hepatitis B infection, optimal duration of treatment is unknown. Viread may be discontinued if there is HepBeAg loss or HepBsAg seroconversion. In HepBeAg positive patients, the 2012 Canadian consensus guidelines suggest that anti-retroviral therapy may be discontinued 12 months after HepBeAg seroconversion. In HepBeAg negative patients, the anti-retroviral therapy may be continued indefinitely or until HepBsAg loss or seroconversion occurs.

在南亞裔中，乙型肝炎是很常見的。在安大略省，大多數醫生會篩選所有高危者，看他們是否攜帶此病。用作診斷病人有沒有接觸過此病的測試包括乙肝表面抗原HepBsAg，乙肝表面抗體Anti-HBs和乙肝核心抗體Anti-HBc。如果一個人HepBsAg呈陽性，則根據定義，該患者已經接觸了該疾病。如果此測試六個月後仍然呈陽性。這病人便會被診斷為慢性乙肝肝炎病毒攜帶者。

一旦確定為乙型肝炎攜帶者，根據建議，應每六個月，進行抽血化驗來監控狀態。建議的檢查包括乙肝表面抗原HepBsAg，乙肝e抗原HepBeAg，乙肝e抗體Anti-HBe，乙肝表面抗體Anti-HBs，乙肝染色體HBVDNA，血小板，轉氨酶AST，ALT，黃膽指數bilirubin，肌肝creatinine，血凝結指數 prothrombin time/INR，肝超聲波檢查，甚至如適合的話，肝CT檢查。其他用作評估肝有沒有纖維化的檢查包括:Fibroscan，Fibrotest和肝活檢檢查 biopsy。

定期監測可以幫助醫生鑒別哪些患者需要開始接受治療。醫生根據HepBeAg陽性或陰性，Anti-HBe的情況，ALT水平和HPVDNA水平來作出應否治療的的建議。如果這些指數未符合應否治療的標準，醫師會建議評估肝有沒有纖維化的情況，來決定應否接受治療。評估肝有沒有肝纖維化的檢查包括Fibroscan，Fibrotest，甚至肝活檢檢查。如檢測到有肝纖維化，醫生也會建議病人接受治療。治療的目標是防止肝硬化及其併發症，預防肝衰竭和避免發展至肝癌。

加拿大治療肝炎的專家發出的Canadian Consensus Guidelines指引建議初次接受治療和對拉米夫定(lamivudine)有抗藥性的乙肝患者，服用tenofovir(Viread)為第一線治療慢性肝炎的藥物。這藥的服用劑量是每日一次300毫克，研究顯示於240週仍能有效控制病毒少於（HBV DNA <400單位/ml）和沒有出現突變抗藥性的現象。研究也顯示，治療後，量度纖維化的指標也有改善。研究也證實在肝硬化病人中，有73%的肝硬化患者的情況有好轉和極安全。

開始了治療慢性乙肝感染的患者，需要持續治療多久的時間是沒有肯定的。通常如表面抗原(HepBsAg)已消失，和出現表面抗體(Anti-HBs)，病人便可以停止接受治療。在HepBeAg呈陽性者，2012年加拿大的共識指引建議，在e抗原(HepBsAg)消失，產生e抗體(Anti-HBe)12個月後，治療便可終止。在HepBeAg呈陰性的患者中，抗病毒治療可無限期服用或直至HepsAg表面抗原消失或持續至產生表面抗體(Anti-HBs)為止。如讀者有任何疑問，請與自己醫生商量。

6. 新的非侵入性產前篩查
New Non - Invasive Prenatal Testing

資料提供：*Ms Carly Pouchet*
Gamma-Dynacare Laboratories,
Rouge Valley Health System Genetics Clinic
編譯：馮根英 家庭醫生 *Dr. Kan Ying Fung MD*

Abstract

What is prenatal screening?

In general, tests done during pregnancy to screen for health problems with the mother or the baby can be called prenatal screening. Besides routine blood tests to check for diseases in the mother such as anemia, thalassemia, mother's blood type and group, HIV, Hepatitis B, immunity to rubella, chickenpox status etc, there are other tests to screen for the risk that the fetus is affected by certain other conditions

What conditions can be screened by prenatal screening?

Abnormalities involving the chromosomes of the fetus can be screened by prenatal screening. Chromosomes are strands of DNA that carry genetic information. Humans have 23 pairs of chromosomes, one copy of each from each parent, numbered 1-22, the 23rd pair is either a XX pair for females or a XY pair for males.

An abnormal number of chromosomes, for example an extra chromosome, is called an aneuploidy. The risk of aneuploidy increases with the woman's age. There are several ways to screen for aneuploidies during pregnancy, and we will review these screening methods in more detail.

Trisomy 21, commonly called Down Syndrome, is due to an extra chromosome 21 and is the most common chromosomal aneuploidy. Trisomy 21 is associated with mild to severe intellectual disabilities and may also be associated with digestive disease and congenital heart defects. It is estimated that trisomy 21 is present in 1 out of every 800 births in Canada.

Trisomy 18 is due to an extra chromosome 18. It is associated with a high rate of miscarriage. Infants born with trisomy 18 often have congenital heart defects as well as various other medical conditions that lead to a shortened lifespan. It is estimated that trisomy 18 is present in approximately 1 out of every 6,000 births.

Trisomy 13 is due to an extra chromosome 13. This is also associated with a high rate of miscarriage. Infants born with this disease usually have severe congenital heart defects and other medical conditions that can lead to a shortened lifespan. Survival beyond the first year is rare. It is estimated that trisomy 13 is present in approximately 1 out of every 16,000 births

Other chromosome aneuploidies that involve the X and Y chromosomes can occur as well. They are less common than trisomy 21, but the combined incidence is approximately 1 in 500 live births. Children with aneuploidies involving the X and Y chromosomes typically appear normal, and the majority of these are not associated with birth defects. The presence of an extra X or Y chromosome may lead to some learning disabilities that affect language and reading skills.

Aneuploidies involving other chromosomes are extremely rare as they result in miscarriage very early in the pregnancy, often before the pregnancy is recognized.

Please see attached karyotypes for a male person and a female with Down syndrome in the following section.

Other non –chromosomal conditions that can be detected by prenatal screening are open neural tube defects. Neural tube defects are typically screened for by looking at levels of alpha-feto protein (AFP) (done through maternal serum screening) in the mother's blood after 15 weeks of pregnancy and/or a detailed obstetrical ultrasound between 18-22 weeks.

Open neural tube defects happen when the brain (anencephaly) or spine (spina bifida) do not develop properly. The brain cannot develop properly in a baby with anencephaly. Babies with anencephaly usually die shortly after birth. Spina bifida is an opening in the bones around the spinal cord. This defect may or may not be covered by skin. Depending on the severity of the defect, and the level of the spinal cord it affects, some individuals with spina bifida may not be able to walk.

What are the available prenatal screening tests?

As technology advances, the list of tests to assess the risk of fetal problems is increasing. Blood tests such as first trimester screening (FTS), maternal serum screening (MSS) and integrated prenatal screening (IPS) have been available for many years. In the recent years, a new test called **non-invasive prenatal testing** (NIPT) has become available. Non-blood screening tests that are available include obstetrical ultrasound for nuchal translucency (NT) and detailed ultrasound to look for anatomical abnormalities at 18-22 weeks. Currently the only two tests that are 100% diagnostic during pregnancy are chorionic villus sampling (CVS) and amniocentesis. Both of these are invasive procedures that require a sample be taken from the pregnancy, and both are associated with a risk of miscarriage.

What is non-invasive prenatal testing (NIPT) ?

Non- invasive prenatal testing (NIPT) is a new way to screen your pregnancy to see if the fetus has an increased risk of having trisomy 21, trisomy 18 and trisomy 13. In any pregnancy, a small amount of the developing fetus' genetic information (DNA) can be found in the mother's blood. This test is done by looking at the fetal DNA in the mother's blood. The purpose of NIPT is to screen for fetuses with a high risk of having the specific conditions mentioned above (trisomy 21, trisomy 18 and trisomy 13). NIPT cannot detect neural tube defects.

What information can NIPT provide?

NIPT can detect >99 % of developing fetuses with trisomy 21 (Down syndrome), at least 98 % of developing fetuses with trisomy 18, and can detect ~80% of pregnancies with trisomy 13. NIPT may also provide some information about the chance of sex chromosome aneuploidies (Turner syndrome 45X, Kleinfelter syndrome 47XXY, Jacob's syndrome 47 XYY and Triple X syndrome 47XXX). NIPT is not perfect. There is a small chance (< 0.1%) that NIPT will say that a fetus does have Down syndrome when, in fact, it does not (false positive). Similarly, there is a small chance that NIPT will say that a fetus does not have Down syndrome when, in fact, it does (ie. false negative).

How and when is NIPT done?

NIPT is done by taking a blood sample from the mother. This can be done any time after 10 weeks gestation of a pregnancy. An ultrasound is needed before to date the pregnancy accurately and to see if there is only one baby or more. An ultrasound is not needed at the time the blood test is taken.

Are there any risks of NIPT to the fetus?

NIPT is a blood test done on the mother. It does not hurt the developing fetus and does not increase the chance of a miscarriage. This is different from other types of testing such as chorionic villus sampling (CVS) and amniocentesis.

Does NIPT replace CVS/amniocentesis?

No. At the present time, NIPT is a screening test, meaning that it cannot tell for certain if your fetus has Down syndrome. If NIPT detects Down syndrome, more testing is needed to see if the fetus really has the chromosome condition. This is done by tests called chorionic villus sampling (CVS) or amniocentesis. CVS and amniocentesis can tell for sure if the fetus has Down syndrome, trisomy 18 or trisomy 13. Both amniocentesis and CVS have a small chance of miscarriage (~1/200).

Who is NIPT for?

At this time, the Ministry of Health and Long-Term Care(MOHLTC) will cover NIPT for women 40 years old and older at delivery carrying a singleton pregnancy, women with a 'screen positive' result from integrated prenatal screening (IPS) , first trimester screening (FTS) and maternal serum screening (MSS), women with a nuchal translucency (from fetal ultrasound) measurement above a certain cut-off, women with a previous pregnancy with Down syndrome or another chromosome condition and certain other circumstances. Some studies suggest that NIPT might be useful in women with a lower risk of aneuploidy as well. The cost of NIPT is approximately Canadian $800 if it is not covered by your health card.

How is NIPT different from other available prenatal screening?

Current prenatal screening tests involve one or two blood samples and usually an ultrasound to measure the thickness of the back of the fetus' neck (nuchal translucency). Information about the risk of the baby being born with Down syndrome, trisomy 18 or open neural tube defects such as spina bifida is provided. Current prenatal screening tests are not as accurate as NIPT for Down syndrome. For example, of every 100 pregnancies where the fetus has Down syndrome, current screening tests can identify 80-90 of the affected pregnancies. NIPT can find >99 of the pregnancies where the fetus really has Down syndrome. NIPT does not look for neural tube defects.

The following table is a summary of the name of the prenatal tests, the conditions that can be detected and when and how the tests are done.

Gestational age when tests are performed	Name of Condition / Name of Test	Trisomy 13	Trisomy 18	Trisomy 21 (Down syndrome)	Open neural defect	Other chromosome aneuploidyy
Blood test between 11 -13 weeks together with pelvic ultrasound for nuchal translucency (NT) measurement	first trimester screening (FTS)	no	yes (not always reported)	yes	no	no
Blood test around 16 weeks	maternal serum screening (MSS)	no	yes	yes	yes	no
First blood test between 11-13 weeks together with fetal ultrasound for nuchal translucency measurement and second blood test at 16 weeks	integrated prenatal screening (IPS)	no	yes	yes	yes	no
Blood test at 10 weeks or more	**non-invasive prenatal testing (NIPT)**	yes	yes	yes	no	XY aneuploidies
Around 18 weeks	detailed ultrasound of fetus (called genetic sonograms at some centres)	yes	yes	Yes about 50%	may be yes	45X can sometimes be detected
		Not all centres report markers for aneuploidies				
Obtain sample between 10-12 weeks (test is invasive)	chorionic villus sampling (CVS)	yes	yes	yes	no	yes
Obtain sample from placenta around 16 weeks (test is invasive)	amniocentesis	yes	yes	yes	may be used to confirm diagnosis	yes

How is NIPT ordered ?

Non- invasive prenatal testing (NIPT) can be ordered by family physicians or specialists. First your doctor needs to contact the laboratory to obtain a NIPT requisition, Ministry of Health and Long-Term Care (MOHLTC) Form 4521-84 and a MOHLTC NIPT questionnaire form. Most laboratories will provide all these forms to physicians upon request. Form 4521-84 (Request for Prior Approval for Full Payment of Insured Out-of-country [OOC] Health Services for Diagnostic Laboratory Testing) can be obtained from www.health.gov.on.ca site as well. NIPT is done out of country, prior approval for payment to be covered by MOHLTC is needed. Payment will only be approved if the pregnancy fits the MOHLTC's criteria. After these three forms are filled out, the forms are faxed to MOHLTC.

According to the MOHLTC website information, as timing is critical in performing this test, response would be received within 48 hours. Once approved, the patient simply takes the approval letter and the laboratory requisition and goes to the laboratory to have the blood taken.

There are three companies that offer NIPT. **Harmony prenatal test** is done by Ariosa Diagnostics with blood collected at any Gamma-Dynacare laboratories location in Ontario. Gamma-Dynacare Medical Laboratories also provide home visits to take blood if requested. The Harmony prenatal test can be done on singleton pregnancies and twin pregnancies. Harmony prenatal test can also be done on singleton pregnancies and twin pregnancies from in-vitro fertilization with an egg donor . The two other available NIPT tests are called Panorama and Verifi.

Normally results would be available in 10 business days. The result will show whether the fetus is low risk or high risk for trisomy 21, trisomy 18 or trisomy 13. The Harmony prenatal test from Gamma-Dynacare offers the option of measuring the X and Y chromosome number to provide the sex of the baby and provide information on the risk of sex chromosome aneuploidies.

For women with results showing high risk, patients should be considered for referral to genetic clinic for further counseling and be considered for further testing such as amniocentesis. In the Greater Toronto area, hospitals that offer genetic counseling include North York General Hospital, Rouge Valley Health System, Mount Sinai Hospital, Mackenzie Health Centre and the Trillium Health Partners Credit Valley Hospital in Mississauga. Amniocentesis can offer definitive diagnosis for chromosomal disorders. However this test is invasive with small chance of causing miscarriage.

For further information, please inquire with your own physicians, visit www.gamma-dynacare.com or call 1-888-988-1888.

什麼是產前篩查？

一般來說，在懷孕期間，為懷孕婦女安排的檢查，來測試與孕婦或胎兒的健康相關的問題都可被稱為產前檢查。除了常規血檢查，來測試懷孕婦女有沒有貧血，地中海貧血，記錄母親的血型，有沒有愛滋病，是否乙肝帶菌者，有沒有風疹抗體，水痘抗體等等；還有其他的測試，以篩查胎兒有沒有其他疾病的風險，也屬於產前檢查。

產前篩查，可以測試到那些疾病呢？

從篩查報告，可告訴醫護人員胎兒患某些疾病的風險。最普通的是檢查胎兒是否有患染色體異常疾病的機會。染色體是帶有基因資訊的DNA鏈和蛋白質。人類有23對染色體。第23對通常是攜帶性別的染色體。正常的女性是一對XX。正常的男性是一對XY。從收集到的胎兒染色體，便可檢查胎兒有沒有不正常染色體數目，即非整倍體 (aneuploidy)的機會。孕婦年紀越大，胎兒患染色體非整倍體的機會也越高。

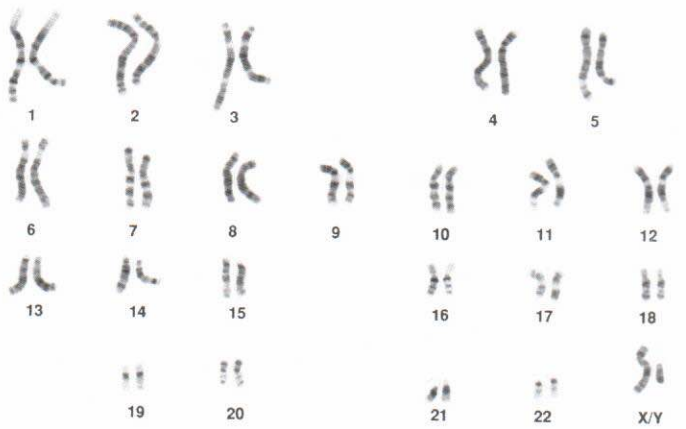
21 三體綜合症 (trisomy 21)，也被稱為唐氏綜合症，是指第21對染色體有多出一條的情況。這是最常見的三體綜合症。患者可能有輕度至中度智能障礙的症狀，而且也可能導致消化系統問題和先天性心臟缺陷。目前估計在加拿大每800名新生嬰兒會有一患唐氏綜合症。

18 三體綜合症 (trisomy 18)，是指第18對染色體有多出一條的情況。有這症狀孕婦流產率頗高。18三體綜合症的嬰兒常有先天性心臟缺陷和其他症狀，引致早逝。估計每6000嬰兒會有一此症。

13 三體綜合症 (trisomy 13)，是第13對染色體多了一條染色體。有此胎兒的孕婦流產率也頗高。患此病的嬰兒通常有先天性心臟缺陷及其他情況。存活超過一歲的機會很微。估計每16,000新生嬰兒中可能會有一嬰兒患此症。

其他包括X或Y染色體數目的情況也是可能發生的，但並不常見。患X或Y疾病的孩童與正常者在表面上沒有差別。這種情況可能會導致學習障礙，影響閱讀和語言技能。患其他染色體疾病的機會少有，因很多時於懷孕早期，便已流產。

請參閱附圖正常男性染色體排列和一女性唐氏綜合症的染色體排列。



正常男性染色體排列

Normal Karyotype (male)

另一通過產前檢查可測試到的非染色體毛病是開放性神經管缺陷 (Open neural tube defect)。

開放性神經管缺陷症是於懷孕15周時通過母體血清篩查 maternal serum screening (MSS)，檢查胎兒蛋白 alpha-feto protein (AFP) 指數或於18 -22周時照詳細胎兒超音波來察看的。

開放性神經管缺陷症是大腦（無腦畸形 anencephaly）或脊柱（脊柱裂症 spina bifida）發育不正常。無腦畸形嬰兒的腦和脊柱不能正常生長，嬰兒通常在出生後不久便死亡。脊柱裂是脊髓周圍的骨頭有裂口。通常這部位可能沒有皮膚覆蓋的。這種情況會導致身體殘障，看那一節脊柱受影響，有時病人無法行走，也可導致智力障礙。

目前有那些產前篩查測試？

隨著科技進步，可測試的檢查正逐漸增加。血液檢查如早期孕期篩查 First trimester screening (FTS)，母體血清篩查 maternal serum screening (MSS)，綜合孕期篩查 integrated prenatal screening(IPS)在過去的幾年已普遍使用。現有一新的測試稱為**非侵入性產前篩查。non-invasive prenatal testing (NIPT)** 已經可測試了。現有的非血液檢查包括:超聲波檢查胎兒的頸透明度nuchal translucency (NT)， 詳細的超聲波觀察胎兒的內部組織，絨毛取樣 chorionic villus sampling（CVS）檢查和羊膜穿刺術 amniocentesis。後者兩個檢查，屬侵入性，需從子宮內抽取樣本，有引起流產的機會的。

什麼是新的非侵入性產前篩查NIPT ？

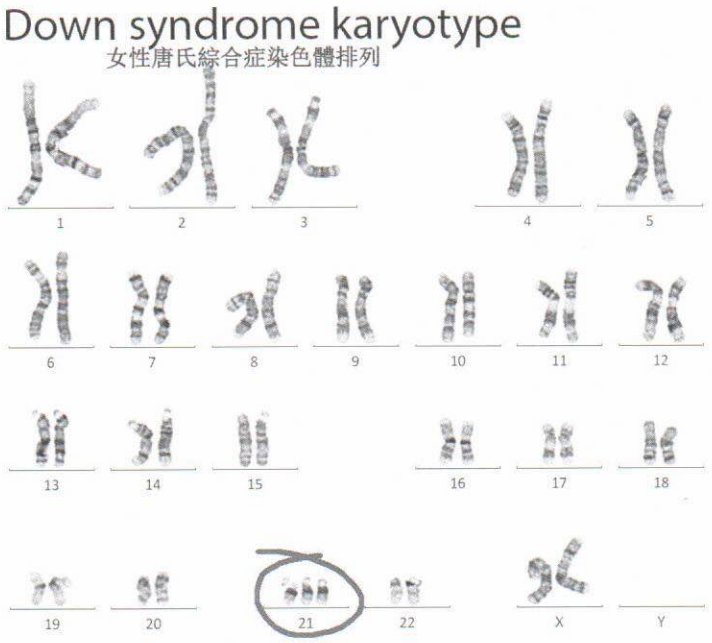
非侵入性產前篩查 (non- invasive prenatal testing) (NIPT)是一種新的產前檢查來篩查胎兒患某些染色體異常的風險。可篩查的染色體病包括21三體綜合症即唐氏綜合症，18三體綜合症和13三體綜合症。懷孕期間，母體的血液內含有少量的胎兒染色體DNA。該試驗通過測試母親血液裏的胎兒染色體，來評估胎兒患各染色體毛病的機會。NIPT 是不能篩查開放性神經管缺陷的。

NIPT 可提供哪些信息？

NIPT可準確的篩查到>99%患有唐氏綜合症的胎兒，至少98%患18三體綜合症的胎兒和約80%胎兒患13三體綜合症者。NIPT也可能提供關於男性，女性染色體數目的疾病機會，如 Turner Syndrome 45X，Kleinfelter syndrome 47XXY，Jacob's syndrome 47XYY 和 Triple X syndrome 47XXX的機會。NIPT不是完美的。有時NIPT報告顯示胎兒患唐氏綜合症，但其實嬰兒沒有此病的。即假陽性(false positive)。同樣也有機會，NIPT報告評估胎兒沒有患唐氏綜合症的風險，但其實，胎兒患有此病。即假陰性 (false negative)。

什麼時候做NIPT 及怎樣做這檢查呢？

NIPT是通過從孕婦抽取血液樣本來完成的。這檢查可在懷孕約10週後，任何時間抽血測試。抽血前需從超聲波檢查胎兒來確定孕期，和確實是否懷一胎。但抽血時是不必同時做 超聲波的。



NIPT 檢查對胎兒有沒有風險 ？

NIPT是從母體抽取血液樣本。不會傷害胎兒也不會引起流產。跟其他測試如絨毛取樣和羊膜穿刺術不同。

那NIPT 是否可代替絨毛取樣 /羊膜穿刺術呢？

不能。目前，NIPT是一篩查，這意味著它不能肯定的告訴我們胎兒是否患有這些綜合症。如NIPT偵察到胎兒有患唐氏綜合症的風險，需再進一步做其他測試來確實胎兒染色體有沒有異常。進一步的檢查可能是通過絨毛取樣或羊膜穿刺術。絨毛取樣或羊膜穿刺術是可以準確地確實胎兒有沒有患唐氏綜合症，18三體綜合症或13三體綜合症的。但是這些檢查會有輕微引起流產機會。

那些孕婦適合做NIPT 呢？

現時，安省保健及長期護理部門 Ministry of Health and Long-Term Care (MOHLTC)免費提供這檢查給分娩時年齡40歲或以上懷一胎的孕婦。從其他檢查:如早期孕期篩查(FTS)，母體血清篩查(MSS)，綜合孕期篩查 (IPS) 或胎兒超聲波檢查發覺 nuchal translucency (NT)有異常者，也可申請免費做NIPT檢查。如孕婦以前有懷過唐氏綜合症胎兒或其他染色體問題的嬰兒或其他毛病，也可申請免費做NIPT的。有些研究顯示其他較低風險孕婦也可做這檢查。不符合MOHLTC免費提供檢查的範圍者，可自費檢查。費用大約加幣 $ 800。

NIPT 與目前其他的產前篩查有什麼不同呢？

目前的產前篩查測試包括抽一次或兩次血，再加上照胎兒頸部透明度(NT)來偵察毛病。可偵察胎兒患唐氏綜合症，18三體綜合症或患開放形神經管缺陷畸形病，如脊柱裂症的機會。這些產前篩查的偵察唐氏綜合症的比率不夠NIPT的報告準確。例如，以唐氏綜合症為例，在100個唐氏綜合症患者中，目前的檢查只可偵察到80-90個個案。但NIPT則可偵察到>99個患此病者。NIPT 是不能檢查出胎兒有沒有患神經管缺陷的。

以下是產前篩查的名稱，可檢測的疾病比照及在什麼孕期和怎樣檢查的比照表。

在孕期何時做這些檢查	疾病名稱 / 檢查名稱	13三體綜合症	18三體綜合症	21三體綜合症(唐氏綜合症)	開放形神經管缺陷	其他染色體異常毛病
11 -13週時抽血和量度胎兒超聲波頸透明度NT	早期孕期 篩查(FTS)	不可以	可以 (報告不一定包括的)	可以	不可以	不可以
約16週 抽血	母體血清篩查(MSS)	不可以	可以	可以	可以	不可以
11-13週 時抽一次血及量度胎兒超聲波頸透明度(NT) 和16週 時再抽第二次血	綜合孕期篩查 (IPS)	不可以	可以	可以	可以	不可以
10週 或以 上抽一次血	**非侵入性產前篩查(NIPT)**	可以	可以	可以	不可以	XY 非整倍體(aneuploidy)
約 18週	詳細胎兒超聲波檢查(有些中心稱為genetic sonogram)	可以	可以	可以(約50 %機會)	可能可以偵察到	有時可偵察到45X
		不是每一中心的報告都顯示非整倍體資料的				
10-12週從胎盤抽取樣本(屬侵入性檢查)	絨毛 取樣 Chorionic villus sampling (CVS)	可以	可以	可以	不可以	可以
16週從胎盤抽取樣本(屬侵入性檢查)	羊膜穿刺術(amniocentesis)	可以	可以	可以	可用作確實患染色體病	可以

怎樣安排做 NIPT 測試？

家庭醫生或婦產科醫生都可安排孕婦做這非侵入性產前篩查NIPT。通常醫生需要先從化驗所取得要求做NIPT的表格。再加上兩張安省保健及長期護理部門MOHLTC的表格:一張名為申請政府付費在國外進行化驗的表格F4521-84 (Request for Prior Approval for Full Payment of Insured Out-of-country [OOC] Health Services for Diagnostic laboratory Testing)。這表格也可以在保健部門www.health.gov.on.ca網頁下載。另一張為NIPT問卷。這些表格是可以向化驗所索取的。NIPT檢查是在國外做的。所以如想政府付費，要符合保健部門標準，等申請批準了，才做的。三張表格填好後，傳真到保健部門。

根據保健部門資料，因這檢查有時間性規定，約48小時，批準信便會發出。拿著批準信和化驗單，到化實驗所抽血，便可。

有三家公司提供NIPT檢查。**Harmony prenatal testing**是由Ariosa Diagnostics 做的。可以在任何安省Gamma-Dynacare化驗所抽血。如有需要，Gamma-Dynacare化驗所以可以安排化驗所員工到孕婦家中抽血的。Harmony prenatal testing 可用於懷一胎或雙胞胎的孕婦均可。也可用於人工受孕的懷一胎或雙胞胎的孕婦。其他公司提供的檢查叫Panorama和Verifi。

通常抽血後，約10個工作日，報告便可收到。結果會顯示，胎兒是低風險或高風險患21三體綜合症，18三體綜合症或13三體綜合症。**Harmony prenatal test**可選擇測量Y染色體數目來提供胎兒性別及有沒有患XY非整倍體的風險。

如報告顯示高風險有某些綜合症，醫生便會與孕婦和家人相量，轉介她到基因診所 Genetic Clinic 評估及考慮作進一步檢查，如羊膜穿刺術(Amniocentesis)。在多市，可提供基因診斷的診所包括北約克全科醫院 (North York General Hospital)，Rouge Valley Health System, Mount Sinai Hospital, Mackenzie Health Centre 和在麥市 (Mississauga) 的 Trillium Health Partners Credit Valley Hospital。羊膜穿刺術可確實胎兒是否有患染色體毛病。但是這檢查屬侵輸入性，有引致流產的風險的。

如想需要更多資料，請向你的醫生查詢或瀏覽www.gamma-dynacare.com網址或致電 1-888-988-1888。

7. 靜脈壁脆弱
Venous Insufficiency

資料來源：*Sigvaris Company*

Abstract

The arterial system uses the power of the heart to drive oxygen-rich blood throughout the body. One -way valves in the venous system aid the flow of blood back to the lungs and the heart (against the pull of gravity) by opening and closing when the calf muscles contract and relax. These valves are fragile and can easily become damaged. Reflux can cause pressure to build within the vein, which stretches the vein walls and weakens them. These valves may become incompetent, which leads to a progression of lower extremity disorders.

Vein diseases can be classified by Clincial Etiology Anatomy Pathophysiology (CEAP) classification system. **C**linical signs can vary from asymptomatic to symptomatic. **E**tiology can be congenital, primary or secondary. **A**natomy describes the affected segment of vein: superficial, deep or perforating veins. **P**athophysiological dysfunction can be reflux, obstruction or both. Symptoms can vary from tired, achy legs to moderate varicose vein, deep vein thrombosis to severe skin changes with ulcer.

Sigvaris graduated compression garments work by acting as an external layer of muscle, gently squeezing the stretched vein walls together and allowing valves to function and restoring blood flow closer to a normal state. Having pressure greatest at the ankle, decreasing as it goes up the leg, helps fight the force of gravity and circulate blood back to the heart more effectively improving overall circulation.

The recommended compression strength at the ankle for the stockings ranges from 15-20 mm Hg to 50-60 mm Hg. The therapeutic effect of graduated compression stocking is based on the compression levels. With proper CEAP classification, the correct compression level at the ankle can be chosen.

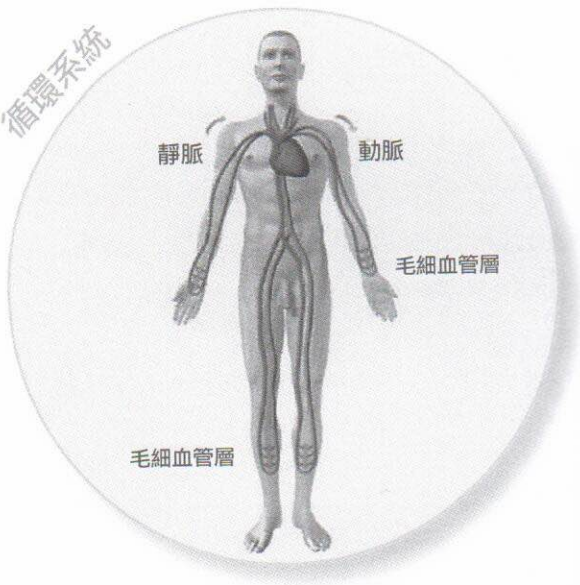
Pregnancy is also a condition that can increase volume load to the veins. There are graduated compression stockings to be worn during pregnancies to prevent vein insufficiencies. A properly measured, sized and fitted stoking will enhance the therapeutic results. Your Sigvaris certified fitter is trained to properly care for you and help make your prescribed therapy a success.

The graduated compression stocking is contraindicated for patients with arterial insufficiency, intermittent claudication, ischemia, uncontrolled congestive heart failure or acute dermatitis. For more information, please consult with your own physician and /or visit www.sigvaris.ca.

靜脈壁脆弱 (靜脈壁無力) (venous insufficiency) 是一種常見的疾病。約五份之一的男性和四份之一的女性人口都會遇到這一問題。患靜脈疾病的誘因有很多，病人往往是先天性遺傳的，因坐久或者久站而缺乏運動，也可能引發靜脈疾病。

靜脈知識：健康靜脈
血液循環系統是如何工作的？

動脈把血液運離心臟，將血液中的氧氣和養分輸送到各個器官和組織。然后靜脈在毛細血管層（比如手和腳中的）收集新陳代謝過的、耗盡氧的血液回流至心臟。



靜脈的功能是甚麼？

靜脈的主要功能是將身體各處的血液運回心臟。我們將腿部靜脈區分為兩種：淺靜脈和深靜脈。淺靜脈更小、更細，位於皮下組織內。在許多人身上清晰可見。淺靜脈將血液運到分布在肌肉內的大深靜脈。腿部大部分的血液（90%）是通過深靜脈運回到心臟的。

靜脈的結構是甚麼樣的？

與動脈血管相比，靜脈管壁要薄很多，彈性也遠比動脈好。這就意味著靜脈管內能容納大量的血液。與動脈不同，很多大靜脈管壁上有靜脈瓣以防止血液倒流。靜脈瓣有防止血液逆流的功能，保證靜脈

血液向心臟方向回流。只有在靜脈血液向心臟回流的時候，靜脈瓣才會打開；當地心吸力使靜脈血液向雙腳方向流動的時候，靜脈瓣就會閉合。

血液是如何實現“向上”回流的？

血液從雙腳回流到心臟的過程中，起到最重要作用的機制是所謂的“腓腸肌泵”。當雙腿運動時，尤其是走路的時候，腓腸肌收縮施壓、腿部腓腸肌間的深靜脈受到擠壓，此時靜脈瓣打開，靜脈管內的血液受壓力推動逆重力向上回流。

當腓腸肌放鬆時，靜脈受壓降低，靜脈管變粗。向心臟回流的血液速度減緩，靜脈瓣關閉。血液就不會逆流。同時，體表靜脈系統中的“新鮮”血液填滿了清空的靜脈血管。

當靜脈系統功能受損，血液就不能再順利回流到心臟。靜脈血流速變慢、沉積。有時候甚至可能逆流，致使腿浮腫幷且感覺疼痛。靜脈無法承受不斷增高的壓力，最糟的情況就是靜脈失去彈性幷延伸變形，之后可能會發生靜脈曲張。整體而言，和以上問題相關的疾病被稱為慢性靜脈功能不全Chronic Venous Insufficiency (CVI).

靜脈疾病帶來的長期損害有那些？

- 蜘蛛網狀靜脈 (spider vein)
- 靜脈曲張 (varicose vein)
- 靜脈炎 (venous statis)
- 血栓 (venous thrombosis)
- 下肢潰瘍 (leg ulcer)

漸進壓力襪-僅僅是另一雙襪子嗎？

幾十年臨床經驗證明，通過對身體組織及血管施壓來治療靜脈和淋巴功能紊亂，是一種純物理療法，此種壓力療法借助於漸進壓力襪可以獲得最佳的療效。為了達到這種功效，漸進壓力襪必須滿足一些特殊的設計條件。獨特的針織工藝確保幷控制施加在腿上的壓力等級，從腳踝到大腿，自下而上逐級循序遞減。這種壓力模式符合德國優質品牌漸進壓力襪協會的各項標準（GZG-德國頒發漸進壓力襪質量保證標準的組織 RAL-GZ387）,而這正是歐洲醫療保險機構同意部分報銷漸進壓力襪費用的先決條件。

漸進壓力襪治療原理是甚麼？

壓力療法是治療慢性靜脈疾病的基本方法。原理很簡單：通過對組織和血管定向施力，擠壓靜脈到正常的直徑，使仍未受損害的靜脈瓣的功能得到了加強，靜脈血流速提高，血液循環得到了明顯改善。這樣可以降低靜脈血管中形成血凝塊的危險。漸進壓力襪最重要的功能是增強“腓腸肌泵”的技能，通過對運動中腓腸肌上施加反作用力，來加速血液回流心臟。這也就意味著只有在雙腿運動的時候，漸進壓力襪才能發揮作用。

根據靜脈疾病的臨床癥狀，靜脈疾病可以臨床癥狀(Clinical)，病因(Etiology)，有病靜脈的位置(Anatomy)和靜脈的病況(Pathophysiology)，即CEAP來分類。臨床癥狀可分為沒有癥狀或有癥狀。病因可能是先天性，靜脈本身問題或是其他毛病引起。受影響的靜脈位置可能是表面靜脈或深層靜脈。靜脈的病況可能是倒流或阻塞。癥狀可輕至腿疲倦，輕度或中度靜脈曲張，深層靜脈產生血塊至嚴重皮膚潰瘍。有了準確的CEAP系統分類，便可選擇適合的踝部的壓力的漸進壓力襪。踝部的壓力由15-20mmHg漸增至50-60 mmHg。漸進壓力襪的療效是受踝部的壓力所影響的。再由受過訓練的壓力襪量度師量度踝節部的尺碼，預訂便可。漸進壓力襪是要每天都穿著才有效的，至為重要。

如懷孕時，體內血量增加，也容易引起靜脈曲張。懷孕時穿著專設計給孕婦的壓力襪，有助預防以後靜脈曲張情況。

以下情況不適合穿著漸進壓力襪：動脈堵塞，間歇性腿部血管供血不足，血管供血不足，未受控的心臟衰間竭或皮膚炎等。欲知詳情，請向醫生查詢，或溜覽網址 www.sigvaris.ca

8. 2015更新安省接種疫苗的指引
2015 Updates in Immunization Guidelines in Ontario

資料來源：安省保健及長期護理部門 *(MOHLTC)*
多倫多公共衛生局 *(TPH)*
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Abstract

In December 2014, The Ontario Ministry of Health &Long-Term Care (MOHLTC) enhanced the publicly funded immunization program. They expanded the eligibility to receive four vaccines : meningococcal conjugate ACYW-135 [Men-C-ACYW] (Menactra ®) vaccine, multicomponent meningococcal B [4CMenB] (Bexsero®) vaccine, pneumococcal conjugate 13 [Pneu-C-13] (Prevnar® 13) vaccine and the tetanus, diphtheria and acellular pertussis (Tdap) (Adacel®, Boostrix®) 3 in 1 combined vaccine.

Meningococcal vaccines

Men-C-ACYW and 4CMenB are vaccines to prevent meningitis caused by the different serotypes of neisseria meningitides (meningococci).

In Ontario, there are three categories of meningococci vaccines available to prevent meningitis. The first category prevents meningococcal group C infection: (Men-C-C) (Menjugate®, NeisVacC® and Meningitec™). The second category prevents meningococcal groups A ,C, Y and W-135 infection: (Men-C-ACYW) . There are three vaccines in this category. Menactra® and Menveo™ are conjugate vaccines. Menomune® is a polysaccharide vaccine. The third category prevents meningococcal group B infection (4CMenB) (Bexsero®).

Men-C-C meningococcal vaccine

Men-C-C is indicated for individuals from age 2 months to adult. Men-C-C is routinely given at one year of age publicly funded. Individuals from 12 years old to 21 years old who have never received this vaccine can also receive this vaccine from the doctors' offices publicly funded. High risk individuals can also receive this vaccine publicly funded.

Men-C-ACYW meningococcal vaccine

Men-C-ACYW protects against types A, C, Y and W-135 meningococci infection. Menactra® can be given from 9 months of age to 55 years of age. Menveo® is indicated for infants from 2 months of age to adults 55 years of age. Men-C-ACYW is given to all grade 7 students publicly funded. Before December 2014, high risk individuals from 2 years of age to 55 years of age can also receive this vaccine publicly funded. High risk individuals over 55 are eligible to receive Men-P-ACWY (Menomune®) vaccine publicly funded.

In December 2014, the MOHLTC expanded the age of high risk individuals to receive Men-C-ACYW by lowering the starting age to 9 months of age to 55 years of age. The eligibility criteria include e.g. individuals with functional or anatomic asplenia, individuals with primary antibody deficiencies, cochlear implant recipients, individuals with acquired complement deficiencies and individuals with HIV.

At the same time, MOHLTC also expanded the publicly funded Men-C-ACYW vaccination program to all high school students. High school students that had never received this vaccine were identified and were notified to be immunized either at public health clinics or at doctors' offices. Other healthy individuals from 2 years to 55 years of age who do not fit the publicly funded criteria can receive the vaccine at own cost.

4CMenB meningococcal vaccine

The second vaccine included in the enhancement program is the 4CMenB vaccine. 4CMenB is a multi-component meningococcal B vaccine that protects again type B meningococci infection. It is the first available vaccine against serogroup B IMD in Canada. The vaccine is recommended for individuals from 2 months of age to 17 years of age. The vaccine is not publicly funded for healthy individuals. There are studies to support that the vaccine is safe to use for individuals over 18 to 55 years old.

December 2014, the MOHLTC has announced that 4CMenB will be included in the publicly funded schedule for high risk individuals from aged 2 months to 17 years of age. The eligibility criteria with specific underlying medical conditions are similar to the criteria to receive the Men-C-ACYW vaccine. Close contacts with a case of invasive meningococcal disease (IMD) caused by serogroup B or individuals who are at risk of an IMD outbreak caused by serogroup B are also eligible.

The recommended intervals to take this vaccine varies with the age at first dose.

Fever has been observed when 4CMenB vaccine as given simultaneously with other routine infant vaccines. The immune response to routine infant vaccines and the 4CMenB vaccine does not appear to be affected though. The rate of fever is found to be reduced if acetaminophen is given either before or after the injection and/or if 4CmenB is given at separate visits from routine vaccines.

Pneumococcal vaccines

There are two common types of pneumococcal vaccines available in Ontario: the polysaccharide Pneu-P-23 (Pneumovax 23) and the conjugated Pneu-C-13 (Prevnar 13) vaccines. They differ in the technology used in making them, their coverage of the pneumococci serotypes, and the duration of immunity. Pneu-P-23 has limited ability to protect children under 2 years of age, while Pneu-C-13 is approved for age 2 months and up.

Pneu-P-23 vaccine

Pneumo23 prevents pneumococcal infection caused by 23 subtypes of pneumococci.It is publicly funded for individuals over 65 years of age and high risk individuals from 2 years of age to 65 years of age.

Pneu-C-13 vaccine

Pneu-C-13 prevents pneumococcal infection caused by 13 subtypes of pneumococci. Pneu-C-13 is given to children from 2 months of age to 5 years publicly funded.

The National Advisory Committee on Immunization (NACI) recommends high risk adults over 18 years of age to be immunized with Pneu-C-13. Pneu-C-13 is also recommended for adults over 50 years of age as they are at risk of developing invasive form of the disease at this age especially if they have other risk factors.

As of December 2014, the MOHLTC has expanded the publicly funded program to include Pneu-C-13 vaccine to high risk individuals 50 years of age and older. The eligibility criteria include individuals who have undergone hematopoietic stem cell transplants, individuals with HIV, Individuals with other immune-compromising conditions such as asplenia, sickle cell disease or other hemoglobinopathies, individuals on long term corticosteroids, chemotherapy, radiation therapy, post-organ- transplant therapy, malignant neoplasms including leukemia and lymphoma and transplant patients .

If one is planning to receive both Pre-C-13 and Pneu-P-23,

it is recommended to vaccinate with Pneu-C-13 first, then follow with Pneu-P-23 at least 8 weeks later. If Pneu-P-23 has already been given, then the dose of Pneu-C-13 should be given at least 1 year after the last dose of Pneu-P-23.

The last vaccine in the enhancement program is the expansion of the tetanus, diphtheria and acellular pertussis 3 in 1 combined vaccine (Tdap) publicly funded to all adults over 18 years of age including those aged 65 and older. Previously the vaccine was publicly funded up to age 64. Individuals that had already received one dose Tdap will be give tetanus and diphtheria (Td) vaccine subsequently every ten years as booster.

The reason for immunizing adults is once adults are protected, the risk that babies contract pertussis from adults would be decreased. Pertussis can be a serious condition if contracted in infancy. Infants are normally given the first dose of pertussis as part of Pediacel (DPTP-Hib) at 2 months of age. This situation leaves a window of significant vulnerability for newborns from birth to 2 months of age. **For this reason, the latest recommendation is all pregnant women should consider being vaccinated with Tdap between 27 to 36 weeks of gestation.**

In response to recent increase in cases of measles in North America, in Feb 2015, new recommendations have been issued by the public health units on measles vaccination. In Ontario, the measles (M) vaccine is combined with mumps (M) and rubella (R) vaccine, commonly called MMR vaccine. **The new recommendation is all Ontarians, regardless of date of birth, are eligible for two doses of publicly funded measles-containing vaccine.** Two doses of MMR should be given at least 28 days apart. MMR and MMRV (the fourth component of this vaccine protects against varicella, commonly called chickenpox) must be given 6 weeks apart. On Ontario, MMR is given to all new borns after the first birthday and MMRV is given between 4 to 6 years of age.Preschool children who are given the second MMR dose before 4-6 years of age can then receive their second dose of varicella only vaccine at age 4-6 years (not MMRV).

The enhancements mentioned in the earlier part of the article are reflected in the attached updated Ontario immunization schedule. For further clarifications or if you have any questions, please consult your own physicians or visit the Ontario government site at www.health.gov.on.ca.

2014年12月，安省保健保健及長期護理部門Ministry of Health and Long-Term Care (MOHLTC)擴闊了符合免費接種四種疫苗的標準。這四種疫苗的名稱為：預防ACY和W-135四型腦膜炎球菌結合疫苗meningococcal conjugate ACYW-135 [Men-C-ACYW] (Menactra®)，多組份的抗B型腦膜炎球菌疫苗multi-component meningococcal B[4CMenB](Bexsero®)，預防13種肺炎球菌的疫苗Pneumococcal conjugate 13 [Pneu-C-13] (Prevnar®13)和預防破傷風，白喉和百日咳tetanus，diphtheria，acellular pertussis [Tdap] (Adacel®, Boostrix®) 的三合一疫苗。

預防腦膜炎疫苗

首先討論的是預防腦膜炎疫苗。在安省獲批准使用的預防腦膜炎雙球菌的疫苗有三類。第一類是預防C型腦膜炎球菌結合疫苗Men-C-C（Menjugate®NeisVacC®和Meningitec™）；第二類是預防A，C，Y和W-135四型的腦膜炎球菌疫苗Men-C-ACYW。這類疫苗共有三種：Menactra®和Menveo®屬結合(conjugate)疫苗，Menomune®屬多糖(polysaccharide)疫苗；第三類是預防B型腦膜炎球菌的疫苗4CMenB (Bexsero®)。

Men-C-C 預防腦膜炎球菌結合疫苗

Men-C-C是一預防C型腦膜炎球菌的結合疫苗。Men-C-C是適合兩個月大至成人接種的。目前，所有嬰兒在一歲時，在醫生診所免費接種一針Men-C-C疫苗。12歲至21歲，未接種過此疫苗者，也可在醫生診所免費接種一針此疫苗。高危人仕也可免費接種。

Men-C-ACYW 預防腦膜炎球菌結合疫苗

Men-C-ACYW預防ACY和W-135四型腦膜炎球菌引起的腦膜炎。此疫苗是適合9個月大至55歲的人仕接種的。Menveo®適合兩個月大的嬰兒至55歲成人接種。幾年前，安省已開始在學校，由公共衛生護士替第七班的學童免費接種這疫苗。高危的兩歲至55歲人仕也可免費接種。超過55歲的高危人仕可免費接種Menomune®。

2014年12月，MOHLTC再把免費接種Men-C-ACYW的年齡擴大。把可以免費接種的最低年齡，降低至九個月大至55歲的高危感染者。高危險人民仕包括：缺脾者，有免疫力差者或愛滋病患者等等。

同時，MOHLTC也把免費接種Men-C-ACYW疫苗的的範圍擴大至所有在安省的中學生。公共衛生局鑒別了那些中學生的疫苗記錄顯示尚未接種過這疫苗，這些學生會收到衛生局的通知信，這些學生可以在公共衛生的局的診所補種，也可以在醫生診所補種，但是醫生是需要特別向公共衛生的局訂取這疫苗的。其他健康正常的兩歲至55歲的人仕，如不符合免費的標準，需自費接種。

4CMenB預防腦膜炎雙球菌疫苗

第二個被納入在保健部門擴大免費接種範圍的疫苗為新的4CMenB疫苗。4CMenB是第一種可預防B型腦膜炎雙球菌感染的疫苗，實際上此疫苗是一多組份的抗B型菌疫苗 multi-component meningococcal serogroup B 疫苗。這疫苗可預防疫苗內所包含的抗原，但不是所有B 型細菌都可以預防的。4CMenB 在加拿大批準接種的年齡是由兩個月大及17歲。但有數據顯示至55 歲人仕，疫苗也可安全注射。

疫苗推出後，加國疫苗諮詢委員會建議兩個月大至十七歲人仕，可考慮接種此疫苗。目前這疫苗沒有被納入免費為健康正常者接種的疫苗範圍內，是要自費的。

2014年12月，保健部門提供免費4CMenB疫苗給高危孩童接種。符合接種的年齡由兩個月大至十七歲。高危疾病跟接種Men-C-ACYW疫苗的病例相似。例如缺脾者，免疫力差者或愛滋病患者等等。接觸過B型腦膜炎患者或有B型膜膜炎爆發時，高危人仕也可免費接種。

這疫苗接種的方法視乎病人在什麼年齡開始接種，雖然所接種的劑量一樣，只是接種相隔的時間和次數有些小差異。

研究人員注意到如4CMenB疫苗與其他嬰幼兒疫苗同時在不同位置接種，四天內，有48% 至63% 的接種者會出現發燒現象。但嬰兒常規疫苗和4CMenB疫苗的免疫反應似乎

沒有受到影響。研究顯示如與其他疫苗分開接種，和在接種前或後服用退燒藥，可能減少50 %的發燒反應，而不影響其作用。

預防肺炎球菌感染疫苗

在安省最常見的預防肺炎球菌疫苗有兩類，分別為多糖Pneu-P-23(Pneumovax23)和接合型(conjugate)疫苗Pneu-C-13(Prevnar13)。它們在制造時使用不相同的技術，覆蓋不同血清類型的肺炎球菌，免疫力的持續時間也不相同。Pneu-P-23適合兩歲以上人仕接種而Pneu-C則在兩個月大時已可開始接種。

Pneu-P-23 疫苗

Pneu-P-23是一可預防23種肺炎球菌感染的多醣疫苗。在安省，此疫苗是免費供給所有65歲以上人仕接種的。兩歲至65歲的高危人仕也可免費接種。

Pneu-C-13 疫苗

Pneu-C-13是一可預防13種血清型肺炎球菌的接合型疫苗。Pneu-C-13是免費提供給所有嬰兒從兩個月大至5歲接種的。加國疫苗顧問局建議18歲以上高危者如有哮喘病，愛滋病或免疫力較差者接種Pneu-C-13這疫苗。但超過50歲的成年人患上侵略性的肺炎球病的風險也很高。尤其是居住在長期護理院或療養院的人士，吸煙者，無家可歸者，酗酒者，患有糖尿病者，有人工耳蝸植入者，癌症患者，免疫系統受損者，患有慢性神經系統疾病，心臟病，肺病，腎病或肝臟疾病的人士。都適合接種Pneu-C-13這疫苗的。

2014年12月，省政府擴展了符合免費接種Pneu-C-13疫苗的範圍至所有50歲以上高危人仕。符合免費接種者包括幹細胞移植者，愛滋病患者，缺脾者，鐮刀血病患者，免疫力弱者，患癌者，器官移植，接受過電療或化療者等等。其他健康正常不符合安省公共衛生免費供應的範圍者，要自費。以上這兩種預防肺炎球菌疫苗是可以兩種疫苗都接種的。若有這需要，研究資料建議先接種Pneu-C-13，於至少8週後再接種Pneu-P-23。如果已經接種了Pneu-P-23，則建議在一年後再接種Pneu-C-13 。

預防破傷風，白喉和百日咳 (Tdap)疫苗

2014年12月宣布的另一新措施是把免費供應每成人一針預防破傷風，白喉和百日咳(Tdap)的疫苗的指引擴展至所有成人。以前此疫苗只免費至64歲，現在擴大至65歲以上人仕。即是從未接種過Tdap疫苗的成人，都可以免費接種一針此三合一Tdap(Adacel或Boostrix)疫苗。十年後，再接種疫苗加強針時，只接種二混合的破傷風和白喉嚨(Td)便可。政府決定讓成人也接種此疫苗的主要原因是這疫苗裏含有預防百日咳成份。嬰兒感染了百日咳是一頗嚴重的情況。在安省的接種疫苗的時間表內，嬰兒到兩個月大才開始接種預防百日咳疫苗 (包括在五聯疫苗內)的。即是嬰兒從出生到兩個月大，未接種此疫苗前，有可能從成人處，包括家人，幼兒園工作者及媽媽，接觸此病。有見及此，最新的建議是所有孕婦在27 周至36孕期時應考慮接種這疫苗。

另外在北美，前一段時間，有不少麻疹個案。故安省公共衛生局於2015年2月發出新的接種麻疹疫苗建議。安省供應的麻疹疫苗是一麻疹(measles)，腮腺炎(mumps)及風疹(rubella)三合一疫苗。簡稱麻腮風(MMR)。新建議是所有安省居民，不論任何年齡，都可免費接種兩針預防麻疹的疫苗。兩針需至少相隔28日。如接種的是MMR及MMRV（這疫苗包含的第四種成份是預防水痘(varicella)的），則需相隔6星期。現時的標準接種時間是一歲生日後接種MMR及在4-6歲時接種MMRV。如未入學的小孩，在4-6歲前已接種了第二針MMR，到4-6歲時，只需接種單一的預防水痘疫苗Varivax II便可，而不是MMRV 。

現將本文前一部分提及的新擴大免費接種範圍的新資料，加在安省兒童接種疫苗的時間表上，供各讀者參考。如果閣下對以上資料有甚麼疑問，請與你的醫生和醫護人員討論。也可瀏覽網址 www.health.gov.on.ca

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圖表一 2015年4月安省兒童接種疫苗時間表

疫苗 / 接種年齡			Pediacel 五聯	Adacel-Polio Boostrix-Pio 四聯	Adacel / Boostrix	Td	Pneumo-coccal conjugate: Prevnar 13	Rotarix (Rot -1)	MMR/Priorix®	Varivax III / Varilrix	Priorix-Tetra (MMRV)	Multi-component Meningococcal B: Bexsero 4CMenB	Meningo-coccal Conjugate: Menactra	Meningo-coccal Conjugate: Menjugate	Recombivax HB Engerix-B	Gardasil	Fluviral, Vaxigrip
預防的疾病	白喉 Diphtheria	15 Lf	✔				13型肺炎雙球菌所引起的腦膜炎肺炎等病	輪狀病毒引起的腸胃炎	麻疹腮腺炎德國麻疹	水痘	麻疹腮腺炎德國麻疹水痘	B型	A, C, Y及W-135型	C型	乙型肝炎	第6,11,16及18類人類乳頭瘤狀病毒引起的子宮頸癌及性病疣	流感
		2 Lf		✔	✔	✔											
	破傷風 Tetanus		✔	✔	✔	✔						腦膜炎雙球菌引起的腦膜炎及敗血症					
	百日咳 Pertussis	20 mcg	✔														
		2.5 mcg		✔	✔												
	小兒麻痺症 Polio		✔	✔			Meningitis, pneumonia etc. caused by 13 types of pneumococci	Diarrhea caused by Rotavirus	Measles, Mumps, Rubella	Varicella (Chickenpox)	Measles, Mumps, Rubella Varicella (Chickenpox)	Type B	Types A, C, Y & W-135	Type C	Hepatitis B	Cervical cancer and genital warts caused by Human Papillomavirus (HPV) type 6,11,16 and 18	Influenza
	乙型流感嗜血桿菌引起的腦膜炎 Haemophilus influenza B (Hib)		✔									Meningitis caused by Meningococci					
1 個月大															X^3	X^4		
2 個月大			X				X	X	X			X^0			X^3			
3 個月大														X^2				
4 個月大			X				X	X	X			X^0						
5 個月大														X^2				
6 個月大			X					X				X^0				X^4		
7 個月大														X^2	X^3			X 六個月大至成人，每年秋或冬季免費接種
9 個月大													X^{00}					
12 個月大							X		X					X				
15 個月大								X		X								
18 個月大			X									X^0						
23 個月大													X^{00}					
兩歲							X 未接種過此類疫苗或未完成基本系列者						X^1					
4 歲				X						X 接種過兩針MMR者	X							
5 歲																		
11 歲																		
12 歲							健康正常小孩						X 在學校接種	X 12歲至21歲未接種過此類疫苗者,可在診所免費接種。	X 在學校接種2針			
13 歲																		
14 歲					X	X 以後每十年	有疾病小孩					兩個月大至17歲高危人仕可免費接種。其他個別可考慮自費接種。	9個月大及55歲高危人仕可免費接種。其他兩歲至55歲健康正常，不符合免費接種範圍者，可自費接種。		不論任何年齡,家庭成員有乙型肝炎帶菌者適合的話可免費接種此疫苗。	X 八年班的女童在學校免費接種三針如在學校未接種或未完成系列者可在衛生局補種其他男女童要自費。	
24 歲										有特殊疾病易感染的人仕,也可免費接種這疫苗。				有特殊疾病易感染的人仕,也可免費接種這兩種疫苗。			
50 歲							加國疫苗顧問局建議18歲以上高危人仕及50歲以上人仕接種。50歲以上高危人仕可免費接種。其他適合接種者需自費。										
64 歲																	
65 歲																	

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華埠醫學進修會提供 2015年 4月

X 安省政府免費供應的疫苗 X^0 加國National Advisory Committee on Immunization (NACI) 建議高危感染或高危接觸感染者及其他個別情況考慮接種。

X^{00} 美國Advisory Committee on Immunization Practices (ACIP) 建議高危者接種。

X^1 加拿大BC 省兒科協會及美國ACIP 建議接種，是自費的。 X^2 加國NACI 建議接種，是自費的。

X^3 來自多肝炎感染國家的家庭，其七歲以下的兒童可免費接種乙型肝炎疫苗。在醫生診所開始接種的時間表。

X^4 如初生嬰兒的母親是乙型肝炎帶菌者，嬰兒在醫院接種第一支疫苗，其他兩支疫苗在醫生診所免費接種的時間表。

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