SHAHID GANGALAL NATIONAL HEART CENTRE

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ANNUAL REPORT 2006

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मितिः २०६३।१०।

शुभ-कामना

अत्याधुनिक उपचारपद्धतिद्वारा स्वदेशमा नै विशिष्ट किसिमको स्वास्थ्यसेवा सर्वसुलभ र सरल तरिकाले उपलब्ध गराउँदै जाने नेपाल सरकारको नीति अनुरूप शहीद गंगालाल राष्ट्रिय हृदय केन्द्रको स्थापना भई यसले मुटुरोगसम्बन्धी अस्पतालको रूपमा सेवा प्रदान गर्दै आएको व्यहोरा उल्लेखनीय छ ।

यस केन्द्रले आफ्ना गतिविधिहरूको जानकारी गराउने उद्देश्यले एक स्मारिका प्रकाशन गर्न लागेकोमा मलाइ खुसी लागेको छ । यस केन्द्रले हृदयरोगको उपचारमा विशिष्ट सेवा प्रदान गर्दै यो संस्था मुटुरोगको उपचारका लागि राष्ट्रिय स्रोतकेन्द्रको रूपमा स्थापित हुन सकोस् भन्ने चाहना राख्दछु । यस केन्द्रको उत्तरोत्तर प्रगति एवं सफलताको निम्ति हार्दिक कामना समेत गर्दछु ।

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माननीय अमिक शेरचन
उपप्रधानमन्त्री एवं स्वास्थ्य तथा जनसंख्या मन्त्री

मितिः २०६३।१०।

विषयः शुभ-कामना

शहीद गंगालाल राष्ट्रिय हृदय केन्द्रले स्मारिका प्रकाशन गर्न लागकोमा मलाई अत्यन्त खुशी लागेको छ । यो स्मारिकाले केन्द्रबाट उपलब्ध हुने सबै सेवाहरू, मुटुरोगका कारण र यसबाट बच्ने उपायको बारेमा जानकारी प्रदान गर्न सक्नेछ भन्ने आशा लिएको छु । मुटुरोगको उपचारको लागि विदेशमा जानुपर्ने बाध्यता रहेको अवस्थाबाट मुक्ति मिलेको स्मरण गर्दै अन्तराष्ट्रियस्तरको सेवा उपलब्ध गराउन यस केन्द्रलाई सफलता मिलोस् भन्ने शुभ-कामना ब्यक्त गर्दछु ।

रामचन्द्र मान सिंह
स्वास्थ्य सचिव

At present, cardiovascular diseases account for nearly half of all deaths in developed world and one fourth in developing world. In 15 to 20 yrs to come, cardiovascular diseases will be the major cause of death in developing world as well. This hard fact is yet to be realised in the policy makering level in our country. Prevention and treatment of communicable, maternal, perinatal and nutritional problems have been the major heath issues in the country for a long time. These issues are still important but we also need to look beyond that. The current position and performance of Shahid Gangalal National Heart Centre has proved that development of advanced health care facilities inside the country is also equally important. Regarding cardiovascular problems, there seems to be few burning issues that needed to be addressed. First, cost involved in the treatment of cardiovascular diseases, be it drugs, surgery or interventional procedures are very high. Hence, better and effective way of prevention remains the only weapon to fight with the problem. We need

long term national plan and policy for prevention. Secondly, as mentioned above, cost involved in the treatment of cardiovascular diseases are so high that majority of the people can not afford it. Government needs to give more financial support to the public institutions providing advanced cardiovascular services so that they can provide service for free or in subsidised rates. Free valve and Children Assistant Program (CAP) are examples of positive steps towards this.

The year 2007 has brought us rays of hope, happiness, optimism and peace. Nepalese, from all walk of life are looking forward to a better future and better nation. We, inside SGNHC, also feel the same way. Last one year was also quite exiting and challenging for us. Expansion project of additional 100 bed hospital is going on. It will be completed within one year. OPD, Emergency and in door patient numbers kept on increasing; diagnostic and therapeutic procedures also followed the same trend; few new services were introduced in the country for the first time; few research work, preventive programs and

community out reach programs were conducted. This annual report reflects much of the work performed in the institute. We thank all those who have contributed to complete all the data and submit to the editorial board.

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शहीद गंगालाल राष्ट्रिय हृदय केन्द्र स्थापना भएको ११ वर्ष भएको छ । यस अवधिमा केन्द्रले थुप्रै चुनौतीहरू पार गर्दै एक व्यस्त तथा विशिष्ट अस्पतालको रूपमा स्थापित भएको छ । यस केन्द्रमा पर्न आएको चापले पनि यस देशमा यस्तो विशिष्ट अस्पतालको औचित्यलाई अझ बढी साबित गरिदिएको छ। विगत एक वर्ष यस केन्द्रको लागि चुनौतिपूर्ण तर धेरै नै सार्थक रहेको मैले महसुस गरेको छु । विरामीको बढ्दो चापलाई सम्हाल्नु कठिन काम त छँदै थियो, सेवाको गुणस्तर तथा मानवीय संवेदनशिलता कायम राख्नु झनै कठिन थियो ।

विगत वर्षमा थुप्रै नयाँ थालनीहरू भएका छन्: केन्द्रमा एक आधुनिक अस्पताल भवन निर्माण कार्य करिब अन्तिम चरणमा पुगेको छ । यसमा हुने थप १०० शैयाले विरामीको चापलाई सम्हाल्न सहज हुनेछ तथा विरामीहरूका लागि सुविधामा वृद्धि समेत हुनेछ । कर्मचारीहरूको लागि आवास गृह थप तथा नयाँ उपकरणहरू जडान एवं सेवा विस्तारको कार्य यस वर्ष पनि जारी रह्यो । सन २००६ को अवधिमा मात्र एकहजार भन्दा बढी शल्यक्रिया तथा करीब दुईहजार Cath Procedure हरू भएका छन् । मुटुरोगको उपचारमा कठिन मानिने Electrophysiology सेवा, नवजात शिशुहरूको जटिल शल्यक्रिया तथा Fetal Echocardiography साथै Primary Angioplasty जस्ता सेवाहरू नियमित रूपमा उपलब्ध भइरहेका छन् । यी आंकडाहरूले यस केन्द्रलाई एक व्यस्त तथा स्थापित मुटुरोग अस्पतालको रूपमा परिचित गराएका छन् ।

विगत वर्षहरू जस्तै यस वर्ष पनि केन्द्रमा कर्मचारीहरूको वृत्ति-विकास, अन्तराष्ट्रिय विज्ञहरूसँगको ज्ञान र सिपको आदान प्रदान जारी रह्यो । त्यस्तै यस केन्द्रमा विदेशबाट वा देशका अन्य शैक्षिक संस्थाहरूबाट आउने स्नातक, स्नातकोत्तर तथा विशेषज्ञ चिकित्सकहरूलाई तालिम प्रदान गरिएको छ ।

केन्द्रको उपचारात्मक कार्य बाहेक देशका विभिन्न भागमा स्वास्थ्य शिविर तथा जनचेतना मुलक कार्यक्रमहरू पनि सञ्चालन गरिएको छ । यसै वर्षदेखि हृदयघातका कारणहरूको खोज अनुसन्धान कार्य शुरू गरिएको छ । यस केन्द्रका विशेषज्ञहरूद्वारा विभिन्न राष्ट्रिय तथा अन्तराष्ट्रिय विषयगत पत्रिकाहरूमा खोज/लेखहरू प्रकाशन भएका छन् यसबाट हाम्रो आफ्नै गुणस्तर वृद्धि हुन जाने मात्र नभई अन्तराष्ट्रिय क्षेत्रमा यस केन्द्र र देशको समेत पहिचान सुदृढ हुँदै जाने विश्वास लिएको छु ।

उपचारमा गरीब तथा निमुखा जनताको पहुँच सुनिश्चित गर्ने कार्यमा विगत वर्ष ऐतिहासिक नै भएको मैले महसुस गरेको छु । स्वास्थ्य सेवा जनताको आधारभुत अधिकारको रूपमा मान्य हुँदै आएको परिवेशमा यस केन्द्रले पनि नयाँ कार्यक्रम शुरु गरेको

छ । विगत आ.व. २०६२।०६३ मा मात्रै करिब १ करोड २५ लाख बराबरको निशुल्क सेवा गरीब विरामीहरूलाई उपलब्ध गराइएको थियो । चालु आ.व. २०६३।६४ देखि १५ वर्ष मुनिका बालबालिकाले आर्थिक अभावका कारणले अल्पायुमै ज्यान गुमाउन नपरोस भनि विशेष कार्यक्रम शुरू गरिएको छ । नेपाल सरकारले यस प्रयोजनको लागि रू. २ करोडको व्यवस्था गरेको छ । यस कार्यक्रम शुरू भएको प्रथम ६ महिनामा नै ३२० जना गरीब बच्चाहरूको निशुल्क उपचार स्वीकृत भई १७० जनाको क्याथ तथा शल्यक्रिया समेत भईसकेको छ । यस कार्यक्रमले गरीब जनताको राज्य र सरकारप्रतिको विश्वास जगाई दिएको छ भने हामी स्वास्थ्यकर्मीहरूलाई उनीहरूको जीवनदानमा सहयोगी हुन पाएको सुखद अनुभूति भएको छ। यस कार्यक्रमलाई जुनसुकै अवस्थामा पनि जारी राख्न नेपाल सरकारको सहयोग रहने छ भन्ने मैले विश्वास लिएको छु ।

विगत जस्तै यो वर्षपनि गैर सरकारी संस्थाहरू तथा विभिन्न व्यक्तिहरूको सहयोग उल्लेखनीय रह्यो ।

कार्यसम्पादनमा आर्थिक अनुशासनका क्षेत्रमा पनि हामीले सन्तोष लिने ठाउँ रहेको छ । विगत ५ वर्षदेखि नै केन्द्रले र सरकारले राखेको लक्ष्यभन्दा बढी प्रगति भएको देखिन्छ । त्यस्तै विगत केही वर्षदेखि आ.व. २०६१।०६२ सम्म केन्द्रको बेरूजु शुन्यमै कायम राख्न हामी सफल भएका छौं ।

माथि उल्लेखित सकारात्मक प्रगतिका बावजुद केन्द्रका आगामी दिन चुनौतिपूर्ण हुनेछन् । नियमित सेवा प्रदान गर्नुका अलावा नयाँ प्रविधिको आयात, शिक्षण तथा सार्थक अनुसन्धान कार्यहरूलाई सँगसँगै अगाडि बढाउनु पनि उत्तिकै महत्वपूर्ण छ । विरामीको बढ्दो चाप र नयाँ भवन पूर्ण सञ्चालनमा आएपछिको आर्थिक दायित्व धान्न केन्द्रले धेरै मेहनेत गर्नुपर्ने हुन्छ । संस्था ठूलो हुँदै जाँदा चुस्त र अनुशासित ढङ्गले अस्पताल व्यवस्थापन गर्नु अरू बढी कठिन हुने निश्चित छ, तथापि हालसम्म देखिएको यस केन्द्रका सम्पूर्ण प्राविधिक तथा प्रशासनिक कर्मचारीहरूको मेहनत, लगन तथा जिम्मेवारीवोधले यस केन्द्रलाई अरू अघि बढाउन सकिन्छ भन्नेमा म विश्वास गर्दछु ।

अन्त्यमा यस केन्द्रलाई प्रत्यक्ष वा परोक्ष रूपमा सहयोग पुऱ्याउने सरकारी तथा गैर सरकारी निकायहरू, सञ्चालक समितिका पदाधिकारीहरू, अन्य अस्पताल तथा विरामीहरू, सहयोग गर्ने चन्दादाताहरू तथा ब्लड डोनरहरू, विरामी तथा विरामीका अभिभावकहरू, केन्द्रका सहकर्मी साथीहरू तथा अस्पतालका शुभचिन्तक महानुभावहरूप्रति म हार्दिक आभार व्यक्त गर्दछु ।

धन्यबाद ।

डा. भगवान कोइराला
कार्यकारी निर्देशक

आ.व.२०६२/०६३ को बार्षिक तथा तेश्रो चौमासिक कार्यक्रमको समिक्षा : एक झलक

बिमल कुमार उप्रेती
प्रमुख, आर्थिक प्रशासन महाशाखा

यस केन्द्रले आ.व.२०६२/६३ मा ६ वटा कार्यक्रम संचालन गर्ने लक्ष्य राखिएको र सो कार्यक्रम संचालनका लागि नेपाल सरकारको तर्फबाट सात करोड पचपन्न लाख, स्वास्थ्य करकोषको तर्फबाट ३ करोड पचास लाख र आन्तरीक श्रोतबाट तेह्र करोड अठ्ठाइस लाख बहत्तर हजार व्यहोर्ने गरी कूल रु.चौबीस करोड तेत्तीस लाख बहत्तर हजारको बजेट व्यवस्था गरिएकोमा यस आर्थिक बर्षमा ६ वटा कार्यक्रम सम्पन्न भै चौबीस करोड आठ लाख सन्ताउन्न हजार खर्च समेत भै उक्त रकमबाट निम्न लिखित कार्यक्रमहरु सम्पन्न भएकोछ ।

१. **<u>मुटुरोगीहरुको परीक्षण सेवा:</u>**

यस चौमासिकमा केन्द्रको बिभिन्न सेवाहरु मार्फत १५,००० जना विरामीहरुलाई मुटुको स्वास्थ्य परीक्षण गर्ने कार्यक्रम राखिएकोमा सो अवधिमा जम्मा २१,१५४ जना विरामीको स्वास्थ्य परीक्षण भएकोछ । यस आ.व.२०६२/६३ मा कुल ४०,००० जना विरामीहरुलाई सेवा पुऱ्याउने लक्ष्य राखेकोमा वार्षिक लक्ष्यको आधारमा यस चौमासिक सम्ममा जम्मा ५९१९० जना मुटुको परिक्षण भै सककोछ । यसरी बार्षिक लक्ष्यको आधारमा १४८% प्रगति भएको देखिन्छ भने तेश्रो चौमासिक लक्ष्यको आधारमा १४१ % प्रतिशत भौतिक प्रगति देखिएकोछ ।

२. **<u>मुटुको शल्यक्रिया सेवा:</u>**

आ.व.२०६२/६३ मा जम्मा ६०० बिरामीको मुटुको शल्यक्रिया गर्ने तथा यसै आ.व.को तेश्रो चौमासिकमा जम्मा २१० जना बिरामीको मुटुको शल्यक्रिया गर्ने कार्यक्रम राखिएकोमा यस आ.व.को तेश्रो चौमासिकमा ३५० जना बिरामीको मुटुको शल्यक्रिया गरिएकोछ । यस आ.व.२०६२/६३ मा ६०० जना विरामीहरुलाई सेवा पु-याउने लक्ष्य राखेकोमा वार्षिक लक्ष्यको आधारमा यस चौमासिक सम्ममा जम्मा ८९६ जना मुटुको शल्यक्रिया भै सककोछ । जसमध्ये ६१३ वटा ओपन हार्ट सर्जरी, ८० बटा क्लोज हार्ट सर्जरी र २०३ वटा अन्य सर्जरीहरु सम्पन्न भएका थिए । यसरी वार्षिक लक्ष्यको आधारमा यस चौमासिक सम्ममा १४९% प्रगति भएको देखिन्छ भने तेश्रो चौमासिक लक्ष्यको आधारमा १६७% प्रतिशत भौतिक प्रगति देखिएकोछ ।

३. **<u>एन्जीयोग्राफी/एन्जीयोप्लाष्टी परीक्षण सेवा:</u>**

आ.व. २०६२/६३ मा जम्मा ६०० बिरामीको मुटुको एन्जीयोग्राफी/ एन्जीयोप्लाष्टी परीक्षण सेवा गर्ने तथा यसै आ.व.२०६२।६३ को तेश्रो चौमासिकमा जम्मा २१० जना बिरामीको मुटुको एन्जीयोग्राफी/एन्जीयोप्लाष्टी गर्ने कार्यक्रम राखिएकोमा यस आ.व.२०६२।६३ को तेश्रो चौमासिकमा ६३९ जनाको उपचार गरिएकोछ । यस आ.व.२०६२/६३ मा ६०० जना विरामीहरुलाई सेवा पु-याउने लक्ष्य राखेकोमा

वार्षिक लक्ष्यको आधारमा यस चौमासिक सम्ममा जम्मा १८५४ जना बिरामीहरुको क्याथल्याब मार्फत अन्य उपचार गरिएकोछ । उपचार गराएको मध्ये ९१५ जना बिरामीको मुटुको एन्जीयोग्राफी, १०७ जना बिरामीको मुटुको एन्जीयोप्लाष्टी, २७६ जना बिरामीको मुटुको पि.टि.एम.सी,१०२ जना बिरामीको पिपिआई,८४ जना बिरामीको टि.पि.आई, ५४ जना बिरामीको इपिएस तथा अन्य ३१६ जना बिरामीको क्याथल्याब मार्फत अन्य सेवाहरु उपलब्ध गराइएको थियो । यसरी वार्षिक लक्ष्यको आधारमा यस चौमासिक सम्ममा ३०९% प्रगति भएको देखिन्छ भने तेश्रो चौमासिक लक्ष्यको आधारमा ३०४% प्रतिशत भौतिक प्रगति देखिएकोछ।

४. **<u>प्रतिकारात्मक सेवा:</u>**

आ.व. २०६२/६३ मा जम्मा २ वटा प्रतिकारात्मक कार्यक्रम सेवा संचालन गर्ने तथा यसै आ.व. २०६२।६३ को तेश्रो चौमासिकमा जम्मा १ वटा कार्यक्रम संचालन गर्ने लक्ष्य राखिएकोमा सो कार्यक्रम अन्तर्गत यस केन्दले ललितपुर जिल्लाको लेले गा.बि.स.मा मुटुरोगीहरुको लागि १ दिने स्वास्थ्य शिविर संचालन गरी कार्यक्रम सम्पन्न गरिएको थियो । यसरी वार्षिक लक्ष्यको आधारमा यस चौमासिक सम्ममा १००% प्रगति भएको देखिन्छ भने तेश्रो चौमासिक लक्ष्यको आधारमा १००% प्रतिशत भौतिक प्रगति देखिएकोछ ।

५. **<u>मुटुको भल्भ राहत कार्यक्रम:</u>**

नेपाल सरकारद्वारा शुल्क तिर्न नसक्ने मुटुका गरीब बिरामीहरुका लागि घोषित राहत कार्यक्रम अनुसार स्वास्थ्य मन्त्रालय मार्फत् १०० वटा मुटुका भल्भहरु खरीद गर्न रु.३७ लाख रकम बिनियोजित भै आएकोमा उक्त रकमवाट १०० वटा मुटुका भल्भहरु खरीद कार्य सम्पन्न भै हाल उक्त १०० वटा भल्भहरु प्रकिया पुरा गरी बिरामीहरुलाई बितरण गरिसकिएको र ति बिरामीहरुलाई भल्भ लगाइदिने कार्य नियमितरुपमा भै रहेकोछ । यसरी वार्षिक तथा तेश्रो चौमासिक लक्ष्यको आधारमा १००% प्रतिशत भौतिक प्रगति देखिएकोछ।

६. **<u>पूर्वाधार निर्माण तथा विकास कार्यक्रम:</u>**

आ.व. २०६२/६३ मा जम्मा पूर्वाधार विकास तथा निर्माणका लागि १ वटा कार्यक्रम अन्तर्गत भवन निर्माण तथा मेशिनरी औजार खरीद कार्यक्रम संचालन गर्ने लक्ष्य राखिएकोमा यस आ.व.को तेश्रो चौमासिकमा सम्पूर्ण कार्यक्रम पुरा भै सकेकोछ । यसरी वार्षिक लक्ष्यको आधारमा यस चौमासिक सम्ममा १००% प्रगति भएको देखिन्छ भने तेश्रो चौमासिक लक्ष्यको आधारमा १००% प्रतिशत भौतिक प्रगति देखिएकोछ ।

<u>निष्कर्ष:</u>

यस केन्द्रले चालू आ.व. २०६२/०६३ को बार्षिक तथा तेश्रो चौमासिकमा ६ वटा कार्यक्रम संचालनका लागि वजेटको व्यवस्था गरेकोमा वार्षिक लक्ष्यको आधारमा तोकिएको भन्दा बढी अर्थात् **१००% भन्दा पनि बढी भौतिक प्रगति** हासिल गरेको देखिएकोछ भने चौमासिक लक्ष्यको आधारमा ***१००%* भन्दा वढी प्रगति** भएको व्यहोरा प्रस्तुत आंकडावाट नै देखिन्छ । साथै वित्तीयतर्फ यस तेश्रो चौमासिकमा १००% प्रतिशत प्रगति देखिन्छ भने वार्षिक लक्ष्यको आधारमा पनि ९९.००% प्रतिशत प्रगति देखिएकोछ ।

प्रगति प्रतिवेदन फाराम (ख)
(प्रतिवेदन अवधि: बार्षिक तथा तेश्रो चौमासिक)

१. आ.व. : २०६२/०६३

२. विभाग/महाशाखा/केन्द्रको नाम: शहीद गंगालाल राष्ट्रिय हृदय केन्द्र ।

३. कार्यक्रम र आयोजनाको नाम: शहीद गंगालाल राष्ट्रिय हृदय केन्द्र ।

४. समष्टिगत भौतिक प्रगति:

क) वार्षिक लक्ष्यको आधारमा	>१००%
ख) चौमासिक लक्ष्यको आधारमा	>१००%

५. समष्टिगत खर्च (वित्तीय स्थिति):

क) वार्षिक वजेटको आधारमा	९९.००%
ख) चौमासिक लक्ष्यको आधारमा	१००%

पुनश्च:

(रु.हजारमा)

प्रगति प्रतिवेदन तयार गर्दा नेपाल सरकारबाट प्राप्त अनुदान रु.७५५०० तथा स्वास्थ्य करकोष वाट रु.३५,००० र आन्तरिक श्रोत रु.१,३२,८७२ समेत मिलाइ कूल २४,३३७२ को बजेट प्रस्तुत गरिएको ।

HOSPITAL INDICATORS
F.Y.: 2062 / 063

SN	Indicators	Formula	Third Quarter (FY 062/063)		Annual (FY 062/063)	
			Calculations	Value	Calculations	Value
1	Infection Rate Major Wound Infection	Number of Surgical Cases Infected ---------- X 100 Total Number of Surgical Cases	0 -------X 100 350	0 %	0 ----- X 100 896	0 %
2	Infection Rate Minor Wound Infection	Number of Surgical Cases Infected ---------- X 100 Total Number of Surgical Cases	2 -------X 100 350	0.57 %	3 ----- X 100 896	0.33 %
3	Average Length of Hospital Stay	Total In Patients Days ---------- Total In- Patients	7248 -------- 2409	3.008	20392 --------- 6814	2.99
4	Mortality Rate of Surgical Cases	Deaths of Surgical Cases ---------- X 100 Total Number of Surgical Cases	17 ----- X 100 350	4.85 %	43 ------ X 100 896	4.79 %
5	Mortality Rate of Medical Cases	Deaths of Medical Cases ---------- X 100 Total Number of Medical Cases	39 ------ X 100 2117	1.84 %	97 ------ X 100 6061	1.6 %
6	Doctor: OPD Patient Ratio	Total OPD Patients ---------- Total Doctors	21161 -------- 19	1113.73	59190 ---------- 19	3115.26
7	Doctor: In-patients Ratio	Total IPD Patients ---------- Total Doctors	2409 -------- 35	68.82	6814 -------- 35	194.68
8	Nurse: In-patients Ratio	Total IPD Patients ---------- Total Nurse in IPD	2409 -------- 96	25.09	6814 ------- 96	70.97
9	Percentage of Non-salary Cost	Total Non-salary Cost ---------- X 100 Total Cost	71435902 ---------- X 100 81428028	87.72 %	209180325 ---------- -- X 100 240900457	86.83 %
10	Drug Wastage Rate	Wastage Drug Cost ---------- X 100 Total Drug Cost	0 ---------- X 100 25177630	0 %	0 ---------- -- X 100 58574343	0 %

11	Bed Occupancy Rate	Number of Bed Occupied ---------- X 100 Total Bed Available	7248 ---------- X 100 9500	76.29 %	20392 --------- X 100 27201	74.96 %
12	Right Use of Financial Resource	Total Irregularities Amount ---------- X 100 Total Expenditure	N /A	N /A	0 ---------- X 100 181846976	**0** % For **061/062**
13	Right Use of Surgeon	Total Operated Cases in a Year ---------- X 100 Total Surgeons in a Year	350 ----- X 100 2	175 Cases Per Surgeon	896 ------- X 100 2	448 Cases per Surgeon
14	Poor patients Charge	Number of patient Exempted ---------- X 100 Total Number	159 ------X 100 2409	6.6 %	410 ------- X 100 6814	6.01 %
15	Exemption Rate	of Patients Exempted Cost ---------- X 100 Total Cost for Patients	4038328 ---------- X 100 43856062	9.2 %	9673100 ---------- X 100 140868799	6.86 %
16	Patients Sex Ratio	Female Patients ---------- Male Ratio	9841 ------- 11320	0.86	27290 -------- 31900	0.85
17	Ratio of Referred Patients	Number of Received Referred Patients ---------- Number of Patients Direct Contacted	20950 ---------- 211	99.28	58599 ---------- 591	99.15
18	Cost Recovery Rate	Total Revenue ---------- X 100 Total Cost	59819866.1 ---------- X 100 81428028	73.46 %	157968159.1 ---------- X 100 240900457	65.57 %
19	Clinics Sustain Rate	Number of Operating Special Clinics ---------- X 100 Total Number of Clinics	All Specialists	Clinic	All Specialists	Clinic
20	Average Output Per Day (X-rays)	Total X-rays in a month ---------- Total Number of Operating Days	8567 ------- 107	80.06	23329 --------- 313	74.53
21	Average Output (Lab Test)	Total Routine Tests ---------- Total Number of Operating Days	93813 --------- 107	876.75	256240 ---------- 313	818.65

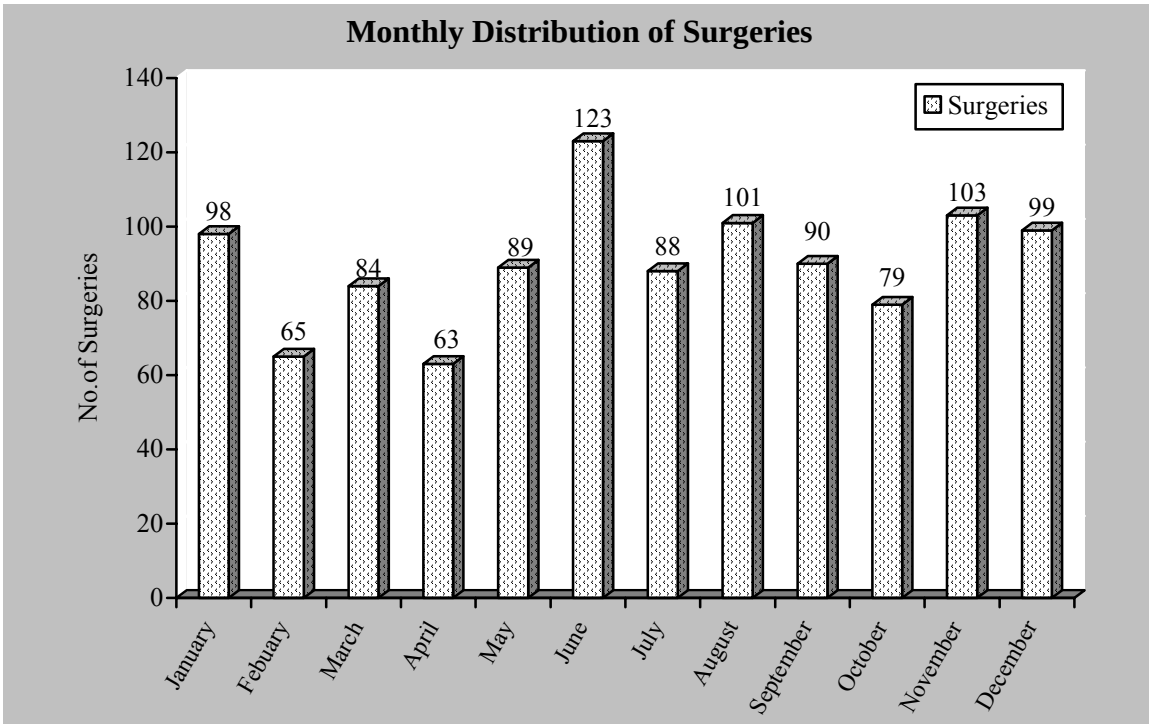
ANNUAL REPORT OF THE DEPARTMENT OF CARDIOVASCULAR SURGERY-2006

Albert Einstein once said *"The Whole of Science is nothing more than the refinement of everyday thinking"* and over the year we in the department have strived to this belief that every day's hard work and miniscule refinements will bear the fruits of its burden in the future.

It gives us pleasure that when we sit at this time, amalgamating all the day's work of the last year to see that we have progressed over each succeeding year to provide quality cardiac surgical care to the population of this country. General awareness of the services provided has had a large increment in the number of indoor and outdoor patients.

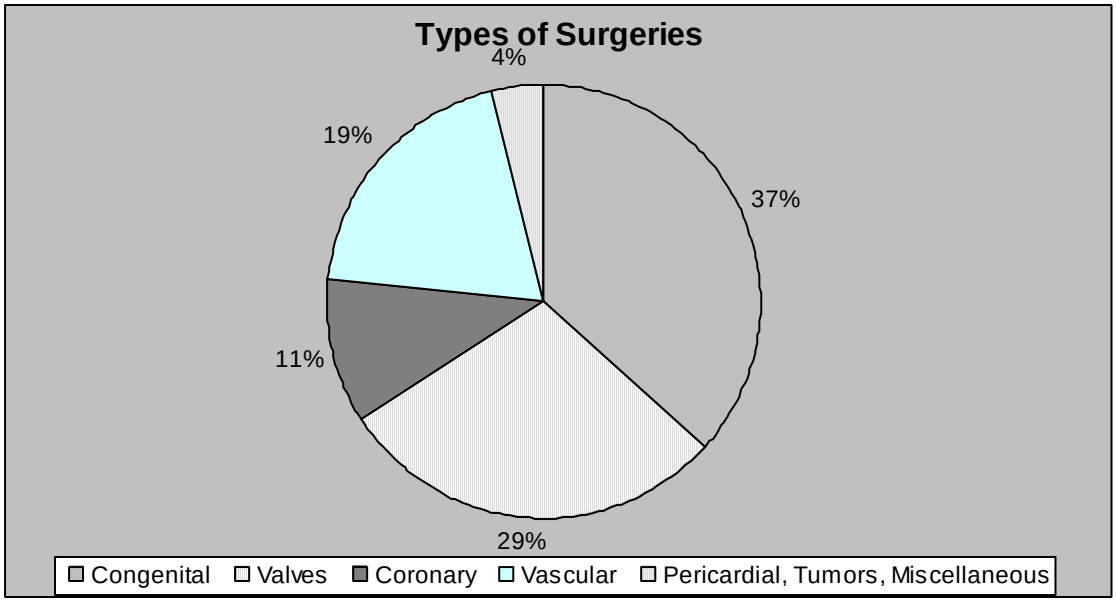
This annual year saw a total of 13962 attendees to the outdoor services, an overwhelming increase in comparison to any other previous years.

This calendar year we performed a total of 1012 surgical procedures which is an increase of 15 % to the previous year.



The surgical procedures comprised of a wide spectrum of cardiovascular diseases done electively as well as in emergency.

Although there has been a steady increase in the total number of surgeries performed in each of the fields of cardiovascular surgery, surgery for Congenital Heart surgery still accounts for the largest volume of the procedures performed at our hospital.



The overall mortality for these surgical procedures was 4.5 %. The figures dominated by complex congenital surgeries and surgeries on infants which serves as an ominous reminder that there is still a lot of improvement and development required in this field of cardiac surgery.

A famous Cardiac surgeon when asked as to why he chose such a demanding field such as his, curtly replied "Birth Asphyxia". This year we welcomed new members into our faculty – Dr. Rabindra Bhakta Timala, Dr.Yogeshwor Man Singh and Dr. Navin Chandra Gautam. With their induction we believe that the future appears even brighter and will definitely embolden us in providing care to our ever increasing number of patients.

This year with the increment in the number of surgeons we were able to expand into two units – one jointly headed by Dr. Bhagawan Koirala and Dr. Jyotindra Sharma and the other by Dr. Ramesh Koirala. With this division we believe that we will be able to develop our cardiac sub-specialties in the future.

We have incorporated this year, rotational training for a period of two months for residents of M.S. (General Surgery) under the National Academy of Medical Sciences. We at the faculty believe that this rotation will provide exposure to the upcoming new surgeons into the field of cardiovascular surgery and help us develop expertise in the country.

We had four surgeons from North Korea attending our department activities for a period of one year to train in cardiovascular surgery. They were exposed to various aspects of cardiac surgery and we hope that their experience in SGNHC will help them in their profession. We wish them all the best for the future.

A notable progress of this year is the provision of budget by the Government of Nepal for surgery for financially weak children under the age of 15 years. This financial assistance has allowed this centre to perform surgical procedures free of cost to this

age group. This form of assistance has been a boon for the underprivileged and us and is probably unique for any country and something that we need to take pride in.

The faculty had notable presence at the International Surgical Conference held in November at Kathmandu. Guest speaker for the conference was Dr. Bhagawan Koirala while Dr. Jyotindra Sharma, Dr. Sidhartha Pradhan, Dr. Rabindra Bhakta Timala and Dr. Bijoy Rajbanshi presented papers of various topics pertaining to cardiac surgery. During the conference Dr. Bijoy Rajbanshi was awarded for one of the three best papers by young surgeons during the conference.

During the month of April, Dr. Bhagawan Koirala visited Michigan University, at Ann Arbour, USA to attend a refresher's course on mitral valve repair. His participation there has helped to enhance our work in this field.

The faculty will be represented in the 53rd Annual Conference of the Indian Association of Cardio Vascular Thoracic Surgeons to be held in Jaipur, India by Dr. Jyotindra Sharma and Dr. Sidhartha Pradhan who will be presenting papers during their visit in mid February.

Although we did not have any renowned visitor of mention in the past year, we have been anxiously awaiting the month of March when we will be organizing a pediatric cardiac workshop for 2 weeks. Representation will be with Paediatric interventionist and intensive care specialist from England led by Dr. Vettukattil from Southhampton Hospital along with Paediatric Cardiac Surgeons from Canada and Austria. We hope such workshop will help to enhance our services in the future and we believe such workshops will assist in eventually getting recognition internationally.

We believe that what we've performed through our endeavors is just a small achievement of what is yet to be done. The task still ahead a mountain, the summit yet approachable, daunting but with every small step forward what we seek appears nigh.

As Winston Churchill once said *"Sure I am of this, that you have only to endure to conquer".*

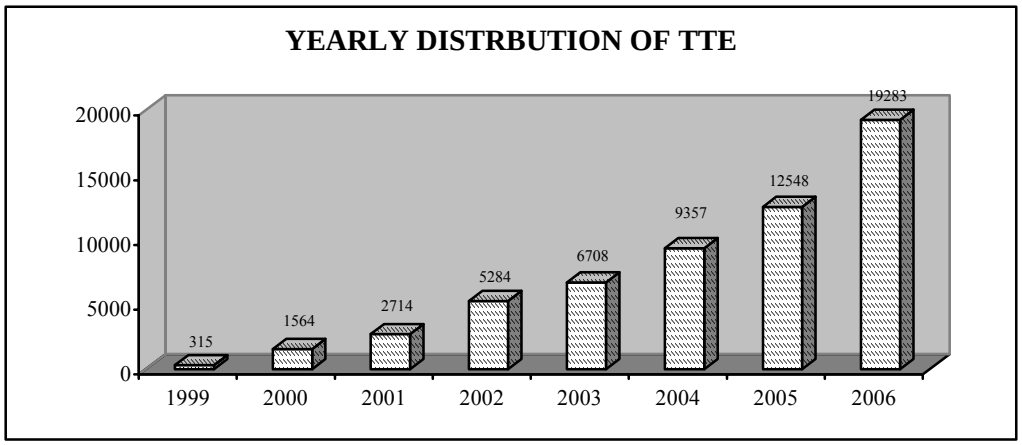
NON-INVASIVE CARDIOLOGY AND OPD SERVICES AT SGNHC

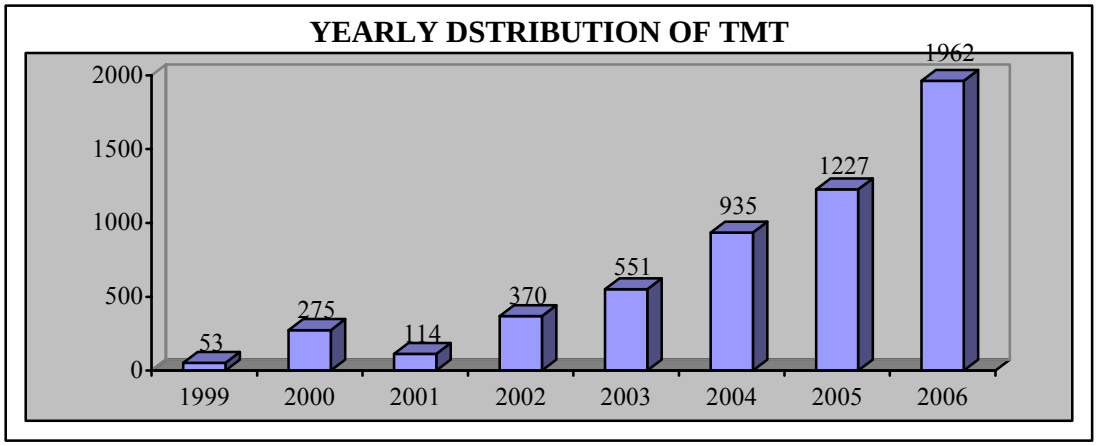
- Dr. S.G. Baidya, *Registrar, Cardiology*
- Dr. D. Sharma, *Consultant Cardiologist*

Reviewing the establishment of Shahid Gangalal National Heart Centre, it is the OPD and non-invasive services that began first. It was when there was no place for admitting the inpatients that these services started from a small leftover building of the Bansbari Shoe factory. It all started with three rooms for out patients clinic, an Echocardiography machine, a TMT machine and a Holter monitoring facility extending service to handful of patients. At present, we have three high end colour-doppler echocardiography machines, and a portable colour-doppler echocardiography machine, two TMT machines, a holter monitoring system, an ambulatory blood pressure monitoring system and not to forget the ECG room which is probably the busiest corner in the centre.

During the last year there have been advancements mainly in the field of Echocardiography. Pediatric echocardiography is one of the main services provided by the centre leading to detection of multiple forms of complex congenital heart diseases which had remained undiagnosed earlier. The number of patients undergoing Exercise Echocardiography as well as Dobutamine stress Echocardiography has significantly increased during the last year and thus has been worth putting forward in this report. This year we have introduced routine fetal echocardiography service in the country for the first time. We do hope this will be of great help in the detection of complex congenital defects earlier during pregnancy. We have in addition started Carotid Doppler study and planning to perform it routinely in the year 2007.

The graphs below summarize the number of patients undergoing various non-invasive procedures.




YEARLY DSTRIBUTION OF TMT
2000
1500
1000
500
0
53
275
114
370
551
935
1227
1962
1999
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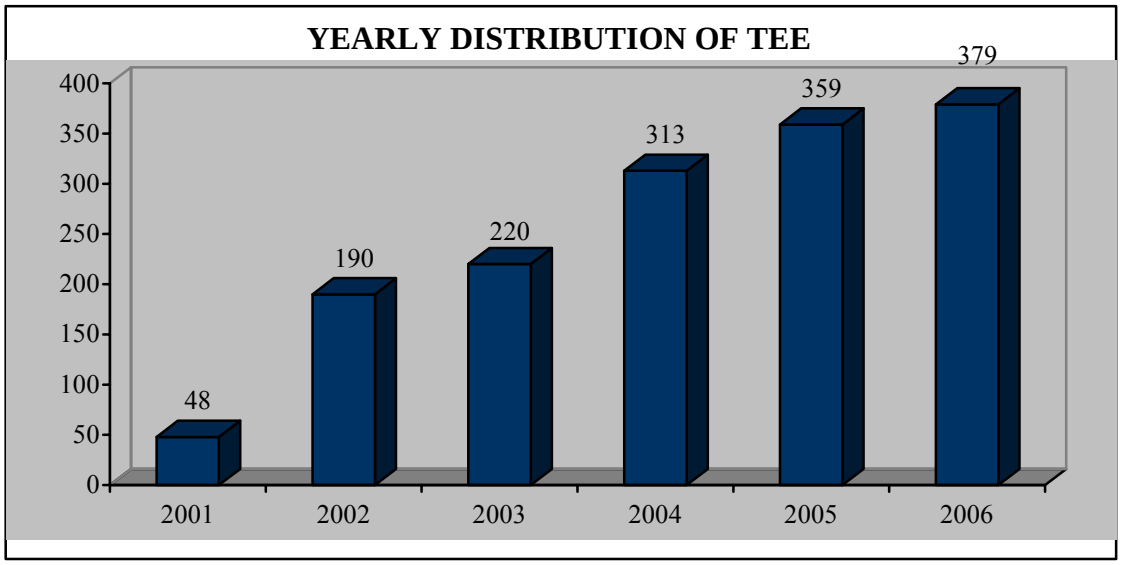
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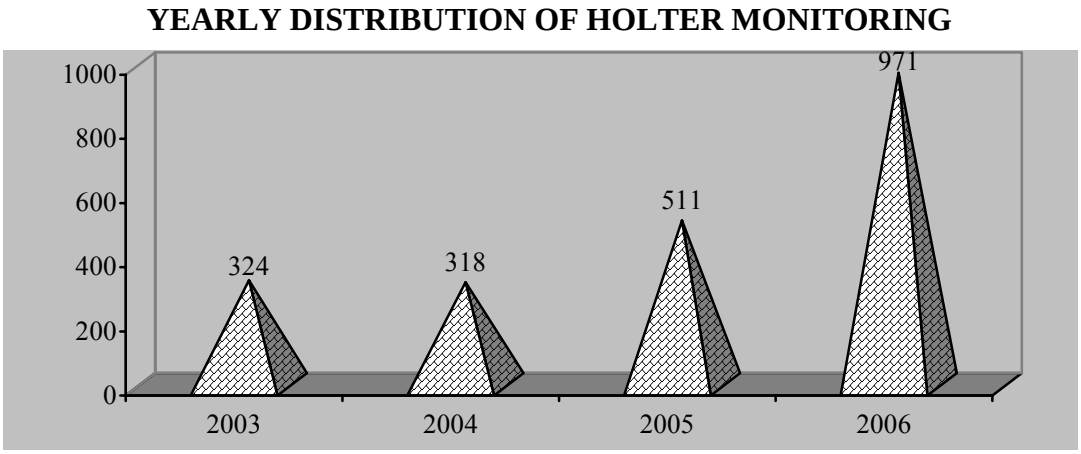
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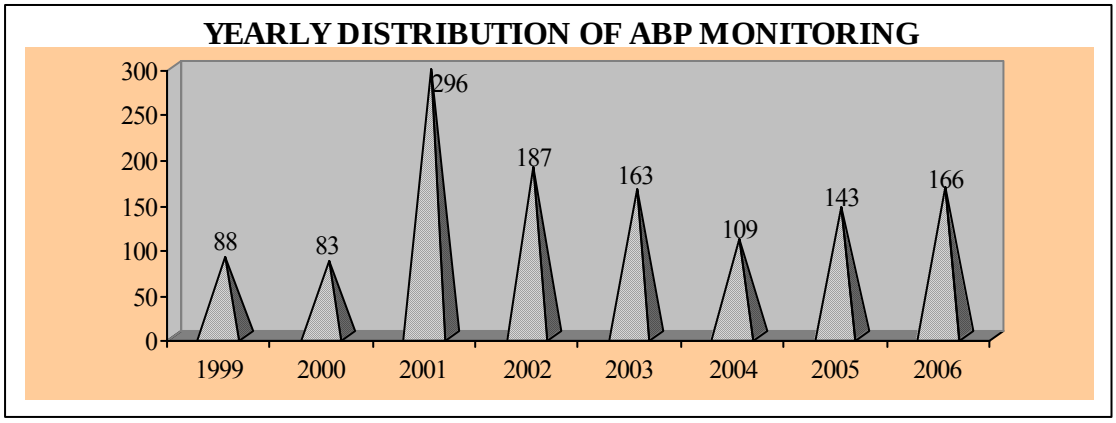


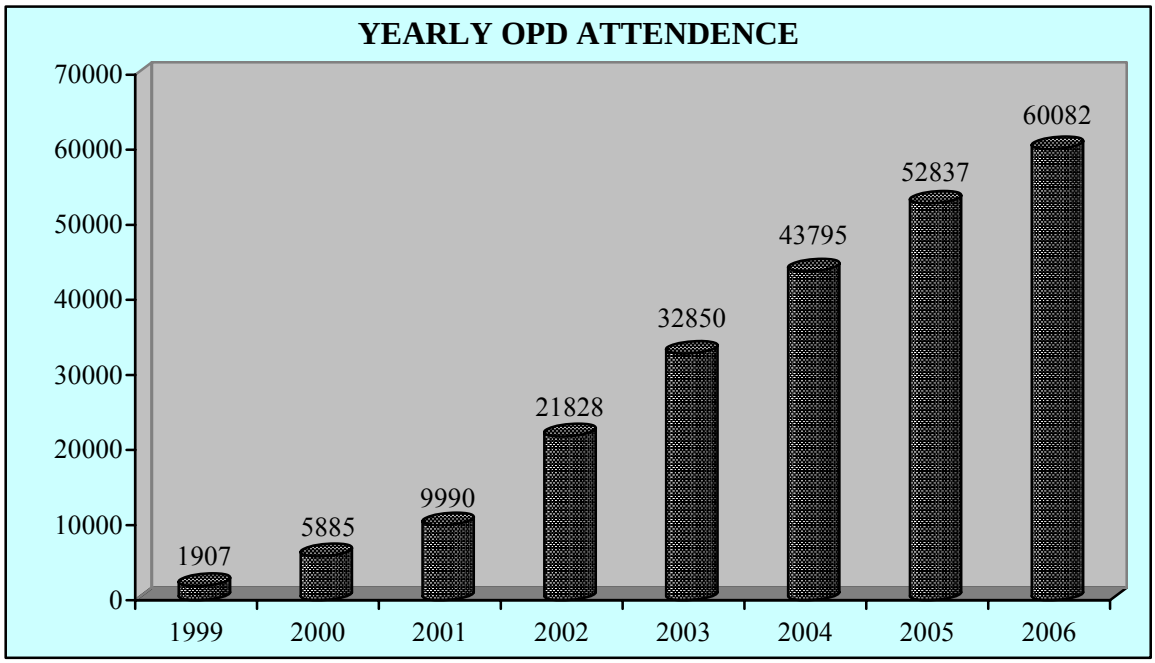
Number of Stress Echocardiography done in the Year 2006

	Male	Female	Total
Exercise Echo	17	6	23
Dobutamine Stress Echo	30	10	40

Total Number of Patients seen at the Out-patients Clinic

	Male	Female	Total
General OPD	32040	28042	60082
Paying OPD*	1200	821	2021

* from August till December only.



In conclusion, the Non-invasive unit at SGNHC has been the starting milestone of the hospital and every year providing a wide range of diagnostic services, helping facilitate other services at the centre. We are further determined to improving on the existing services and acquiring newer technologies in the near future.

EMERGENCY SERVICE AT SGNHC

-Dr. Subodh Kansakar, *Cardiologist*
- Dr. Sneha Shrestha, *Resident Doctor*
- Dr. Santosh Lal Shrestha, *Resident Doctor*

Emergency is a crucial department of any general and specialized hospital. The services provided in the emergency show the true image of the entire hospital. Hospital is not able to run and function to it's fullest without emergency services. Emergency is the place where genuinely serious patients get the prompt medical benefit and services. Emergency is the place where minor cases along with symptomatic serious patients get landed. Medical and paramedical staffs need to be smart, alert and clever enough all the time to handle any patients and quick decisions have to be taken within minutes to hours for discharge, referral and admission without any delay.

Services in SGNHC were started in the late 1990's from OPD with few doctors, nurses and staffs; also the number of patients attended in OPD was few too. Later on; its services were extended to emergency, emergency observation, indoors, intensive care units, cath lab and operation theatre. In a short duration, the hospital has established itself as the only one national tertiary centre for cardiovascular diseases.

In the beginning, only few patients attended our emergency department. But nowadays, hundreds of patients attend our emergency. Many general and tertiary hospitals have now started referring cardiac patients for tertiary care and special investigations. As emergency is one of the crucial departments of our hospital, patients get 24 hours care and services even at night without any delay and interruptions. Direct involvement of residents and specialists (Cardiologists) over 24 hrs for decision making, prompt patient care with well-equipped set-up. Well trained cardiologists and cardiac surgeons are involved 24hrs as on-call and residents, trained nurses are standby as the first line service. Those patients with acute MI are directly shifted to CCU from emergency without any delay. They receive thrombolysis within 30 minutes of arrival to the ER (Door to needle time) as recommended by AHA/ACC guidelines. Those with unstable angina and NSTEMI are promptly shifted to intensive care within fifteen minutes. Patients come to our department with Complete Heart Block and other life threatening brady-arrhythmias get Temporary Pacemaker implantation quickly without any delay. Acute MI patients going for primary Percutaneous Transluminal Coronary Angioplasty are prepared and transferred quickly to the cath-lab from our emergency department. Emergency department served huge number of patients throughout the year. Like in the past, emergency service has consistently maintained efficiency and swiftness. There are altogether 5 beds in emergency and 8 in emergency observation room. In an average, 15-20 numbers of patients attend our emergency department daily.

Relevant and essential emergency test including cardiac enzymes, Troponin-I, blood routine, biochemistry and electrolytes, ABG analysis, ECG, portable X-Ray, screening echocardiography are available 24hrs fro needy patients. Emergency and ER observation are equipped with monitors (With ECG monitoring, SpO_2 , non invasive BP monitoring), centre oxygen line, suction facilities, defibrillators, crash cart with emergency drugs and intubations sets etc. 24hrs ambulance service is provided by 2 well equipped ambulances for our hospitals which are used to for inter hospital transfer of patients. In 2006 total 4755 patients visited our emergency compared to 3668 patients last year.

ER Data in 2006

Year	Male	Female	Admission	Discharge	Referral	LAMA*	Death in ER/ Brought Dead	Total Patient
2006	2600	2155	2070	2401	352	20	28	4755

* Left against medical advice

Admission through ER in Indoors

GW	Cabin	MICU	Step Down	CCU	SICU	ER Observation	Total Admission
336	53	427	418	635	17	269	2155

Top Ten Working Diagnosis at ER in 2005

S. No.	Provisional Diagnosis	Total	Percentage (%)
1	Hypertension	1168	24.56
2	Ischemic heart disease	933	19.62
3	Valvular heart disease	684	14.38
4	Arrhythmias	469	9.86
5	Anxiety disorder	371	7.8
6	Acid peptic disorder	314	6.5
7	COPD/Corpulmonale	286	6.01
8	Congenital heart disease	165	3.47
9	Pericardial disease	64	1.26
10	Others	301	6.33

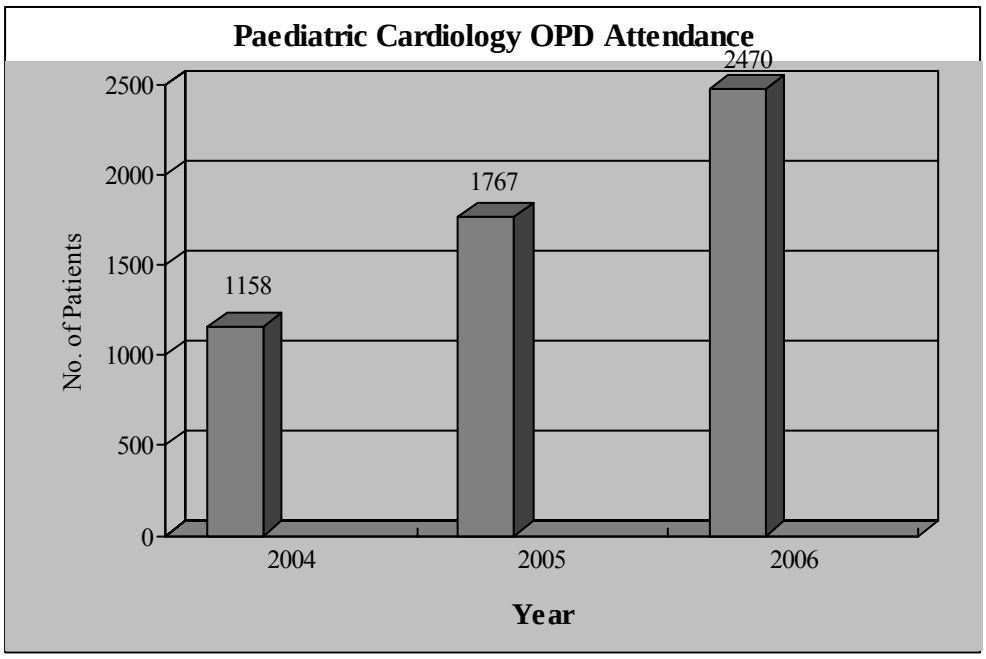
Top Ten Major Complaints for Visiting ER

S. No.	Complaints	Total Patients	Percentage (%)
1	Chest pain/discomfort	1398	29.40
2	Shortness of breath	1149	24.16
3	Palpitation	595	12.51
4	Dizziness/Syncope	469	9.86
5	Heartburn/Epigastric pain	338	7.10
6	Headache	273	5.74
7	Swelling of body	168	3.53
8	Nausea/Vomiting	125	2.62
9	Epistaxis/Hemoptysis/Malena	101	2.12
10	Others	139	2.90

PAEDIATRIC CARDIOLOGY SERVICE AT SGNHC

- Dr. Urmila Shakya,
Paediatric Cardiologist

Out patient clinic in Paediatric cardiology started in Jan 2004. We ran it twice a week then. In the beginning, the number of Out Patient Department (OPD) attendance was very small, not crossing 10 in one OPD day. Most of the patients were referred cases from the valley area with suspected Congenital Heart Diseases (CHD) and Rheumatic Fever. In later days, the OPD number significantly increased and OPD days was scheduled 3 days a week, in alternate days. Most of the OPD patients are referrals from cases from different parts of the country (mostly outside the valley) which is just opposite to 3 yrs back. Similarly, the cases with complex type of CHD are found in increasing numbers e.g. D- Transposition of Great Arteries (D- TGA), Double Outlet Right Ventricle (DORV, different types), Single Ventricle, Complete A-V Septal Defect etc. Sick children who attend OPD who need emergency management in heart failure due to CHD or RHD, in cyanotic spell etc., are immediately taken to the emergency room for needful management, and make them stable for safe transfer to near by Paediatric Centre (Kanti Children Hospital) for admission. This current situation may have created some inconvenience to the patient and his/her family but this centre is going to start Paediatric Cardiology Inpatient service in the near future to cater the full needs of Paediatric cardiac patients.



CARDIOVASCULAR DISEASE PATTERN OF MEDICAL WARD IN 2006

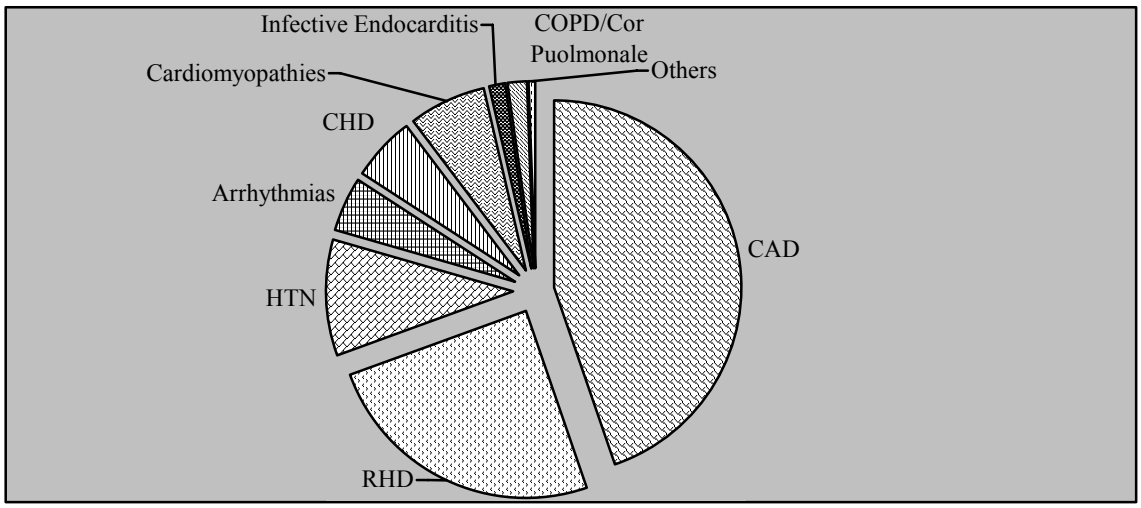
Dr. C.M. Adhikari, *Medical Officer*
Dr. S.G. Baidya, *Registrar, Cardiology*

The General ward is the place where the patients are finally pooled up through both direct admission and the transfer of stabilized patients from the critical care units. General Ward B receives surgical admissions both pre-operative as well as transfers from SICU of stabilized post-operative cases. The general ward in itself started with a 7 bedded unit in the now designated space for the Laboratory with the current 43 beds (19 in General ward A and 24 in General ward B) together with 5 Cabins. During its 8 years of service, thousands of patients from all over the country with cardiovascular disease were admitted and treated. In this article we provide a brief outline of the disease pattern from 1st Jan 2006 to 31st Dec 2006.

During the last year together 2027 patients were admitted. According to the data most of the patients admitted were of coronary artery disease (42.57%) followed by RHD (23.38%) and Hypertension (9.52%). Patients admitted as cases of Cardiomyopathy, Congenital heart disease and infective endocarditis accounted for 6.26%, 5.37% and 1.43% respectively. The total mortality in General ward was 9 (0.44%).

Disease-wise distribution of cases in the year 2006

Disease	No. of Cases	Percentage of total
Coronary Artery Disease (CAD)	863	42.57%
Rheumatic Heart Disease (RHD)	474	23.38%
Hypertension (HTN)	193	9.52%
Arrhythmias	90	4.44%
Congenital Heart Disease (CHD)	109	5.37%
Cardiomyopathies	127	6.26%
Infective Endocarditis	29	1.43%
COPD/Cor Pulmonale	31	1.53%
Others	11	



Pattern of diseases in the year 2002 - 2006

	2002	2003	2004	2005	2006
Coronary Artery Disease	39.50%	39.30%	37.96%	39.19%	42.57%
Rheumatic Heart Disease	20.80%	27.70%	26.10%	20.05%	23.38%
Hypertension	9.60%	8.80%	9.10%	7.49%	9.52%
Arrhythmias	4.20%	8.10%	10.13%	9.64%	4.44%
Congenital Heart Disease	6.80%	4.10%	4.00%	6.09%	5.37%
Cardiomyopathies	6.50%	6.40%	5.06%	9.11%	6.26%
Infective Endocarditis	1.90%	1.20%	0.55%	2.58%	1.43%
COPD/Cor Pulmonale	2.20%	1.20%	0.55%	0.75%	1.53%

There has a been a significant increase in the number of Coronary Artery Disease patients and patients admitted as cases of Hypertension with complications during the last year as compared to previous years.

CORONARY CARE UNIT AT SGNHC

– Dr. Roshan Raut
Registrar, Cardiology

SGNHC, with the primary mission to provide Nepalese people high quality medical care for various types of cardiovascular diseases, has gained a good public faith. The critical care block which has been established and serves as one of the key section in this context. The 17 bedded critical care block has been divided into three sections, CCU (7 beds), MICU (5 beds) and STEP DOWN (5 beds), which has led the medical service to become more co-ordinated, specific and scientific. In MICU, cardiac patients other than acute coronary cases or life threatening arrythmias are kept whereas step-down serves as an intermediary care ward for CCU or MICU patients, once they become stable.

The acute coronary cases and life threatening arrythmias are predominantly admitted in CCU. The delivery of care in the CCU is provided by utilizing a multidisciplinary approach. The 7 bedded CCU is well equipped with comprehensive central monitoring, central oxygen supply, 24 hour mobile X-ray, and 24 hour mobile echocardiography, due to which patient care has become more efficient and easier. On-call cardiologists stay in house 24 hours on top of resident doctors who are on duty. Consultations with other specialists and subsequent interventions are rendered as necessary. The medical staffs are not only well trained and efficient, but are also dedicated to excellence, compassion and integrity in patient care.

This article provides a brief outline of CCU admissions in the year 2006. As expected, there has been dramatic increment in the admissions (from 63 patients in 2001 to 531 patients in 2006), as shown in figure. Patients with Acute Coronary Syndromes (ACS), rhythm disturbances and Cath procedures were predominantly admitted in CCU, comprising 60.7 %, 15.4% and 13.1% respectively. The overall mortality of CCU admissions was 36 (4.1%) (table 1).

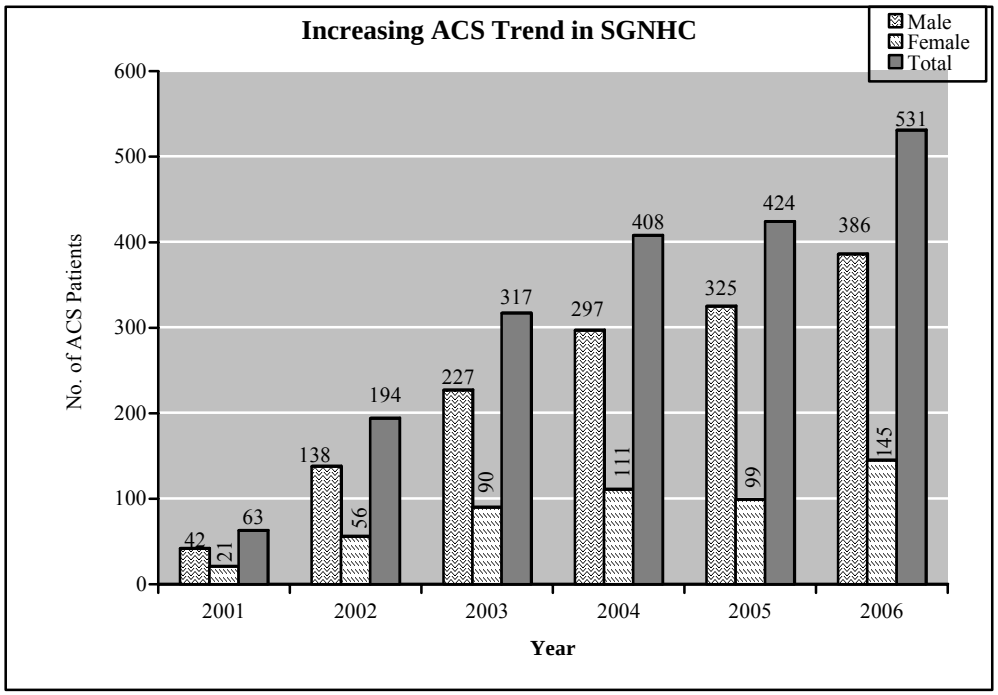


Table 1: Total Admissions in 2006

DIAGNOSIS	Admissions			Mortality		
	Male	Female	Total (%	Male	Female	Total (%)
ACS	386	145	531(60.8)	18	10	28 (5.2)
ARRYTHMIAS	80	55	135(15.4)	0	2	2(1.4)
OTHERS	147	60	242(23.7)	5	1	6(2.8)
Total	**613**	**260**	**873**	**23**	**13**	**36(4.1)**

Table 2: ACS admission pattern in 2006

DIAGNOSIS		TOTAL ADMISSION			STK/PRIMARY PCI RECEIVED			MORTALITY		
		Male	Female	Total (%)	Male	Female	Total (%)	Male	Female	Total (%)
STEMI	Anterior	36	6	42 (19.59)	13	1	14	1	1	2
	Ext. Anterior	30	11	41 (17.08)	7	5	12	3	2	5
	Ant. Lateral	9	0	9 (1.5)	2	1	3	1	0	0
	Ant. Septal	32	5	37 (10.55)	7	2	9	2	2	3
	Inferior	80	17	100 (32.66)	25	5	30	5	3	8
	Posterior	1	0	1 (0.5)	1	0	1	0	0	0
	Lateral	2	1	3 (0.5)	0	0	0	0	0	0
	Inferior &Posterior	3	1	4 (2.01)	1	0	1	0	0	0
	Inferior & Lateral	4	0	4 (5.52)	0	0	0	0	0	0
	Inferior & Anterior	2	2	4 (1.0)	0	0	0	0	0	0
	Inferior Wall with RV Infarction	10	3	13 (4.5)	7	2	9	2	1	3
Total STEMI		**209(82)**	**46(18)**	**255(48)**	**62**	**15**	**77(30)**	**14**	**9**	**23(9.01)**
Unstable Angina		**109(61)**	**68(39)**	**177(40)**	**----**	**------**	**------**	**3**	**0**	**3(1.4)**
NSTEMI		**47(73)**	**17(27)**	**64(12)**	**----**	**-----**	**------**	**1**	**1**	**2 (3.7)**
Total ACS		**365(73)**	**131(27)**	**496**	**-----**	**-----**	**--------**	**18**	**10**	**28 (5.2)**

There were altogether 531 ACS cases admitted in 2006, out of which 255 (48 %) were ST Elevation MI (STEMI), 64 (12 %) were non ST elevation MI (NSTEMI) and rest 212 (40 %) were Unstable angina. Male preponderance was clearly seen as 386 (73%) were male and only 145 (27%) were female. The overall mortality of ACS was 28 (5.2%). Out of 255 STEMI cases, 71 got STK (27.8 %) and 6 (2.4 %) went for PCI, so that revascularization therapy was done in 77 patients (30 %). Overall mortality of STEMI was 23 (9.01%). There were 2 (3.7 %) mortality in NSTEMI while 3 (1.4 %) in Unstable angina (Table 2). The figures are comparable to the figures of west.

Rhythm disturbances were another bulk of patients admitted in CCU. The total number was 135 out of which 80 (60%) were male and 55 (40%) were female. Complete Heart block and Sick sinus syndrome were the major cardiac conditions in that group. If indicated permanent pacemaker was implanted. Apart from ACS and rhythm disturbances, Cath procedures were another bulk of patients admitted in CCU. Cath procedures mainly included post PCI, patients with high risk coronary morphology, and complicated cath. procedures. Additional 23 % admissions were mainly heart failure, hypertensive emergency, chest pain and syncope. The two deaths so categorized in "miscellaneous", (table 4), were aortic dissection and prosthetic valve thrombosis.

Table 3: Cardiac Arrhythmias

DIAGNOSIS	Male	Female	Total	Percentage
Complete Heart Block	46	27	73	54
Sick Sinus Syndrome	8	11	19	14
II degree AV block	2	4	6	4.4
Bradycardia/junctional rhythm	6	4	10	7.4
AF	6	2	8	5.9
VT	8	3	11	8.1
PSVT	4	4	8	7.4
Total	**80 (60%)**	**55 (40%)**	**135**	**100%**

Table 4: Others

DIAGNOSIS	Admissions			Mortality		
	Male	Female	Total (%)	Male	Female	Total (%)
Heart Failure	15	11	26(12.5)	1	1	2 (7.6)
Hypertension	4	2	6 (2.8)	0	0	0
Chest Pain	25	13	38 (18.3)	0	0	0
Syncope	2	1	3 (1.4)	0	0	0
Cath. Procedures	89	26	115 (55.5)	3	1	4(3.4)
Miscellaneous	12	7	19(9.1)	2	0	2 (10.5)
Total	**147**	**60**	**207 (100)**	**6**	**2**	**8(3.8)**

ANNUAL REPORT OF DEPARTMENT OF ANAESTHESIOLOGY

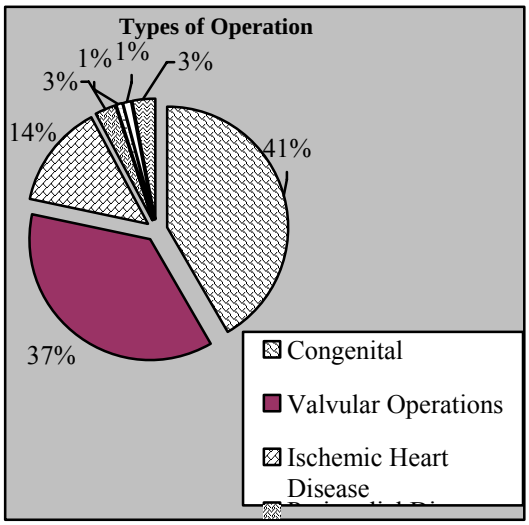
- Dr. Jeju Nath Pokharel
- Dr. Murari Raj Upreti

The department of anaesthesiology, however small, in its size, has been catering to the ever expanding surgical and interventional volume of this hospital. The mismatch will get worse with the expansion of the hospital.

Just to remind the work-load of an anaesthesiologist; we anaesthetize about 3.3 patients per day. One patient takes about 3-4 hrs in an average apart from other works in the hospital.

Following are the anaesthetized patients according to the type of the surgery or procedure. In cath lab total cases were 124 and among them 88 patients received general anaesthesia and 36 patients received the monitored anaesthesia. In operation theatre a total number 883 patients were anaesthetized and their distributions according to surgery are given below.

Total No. of cases: 1007 cases
Catheterization lab: 124 cases (12.31%)
Operation theatre: 883 cases (87.68%)



Among the operated cases:
Congenital: 354 cases (40.09%)
Valvular operations: 313cases (35.44%)
Ischemic heart disease: 117 cases (13.25%)
Pericardial diseases: 24 cases (2.71%)
Intracardiac tumour: 7 cases (0.79%)
Others: 8 cases (0.90%)
Re-exploration: 27 cases (3.05%)

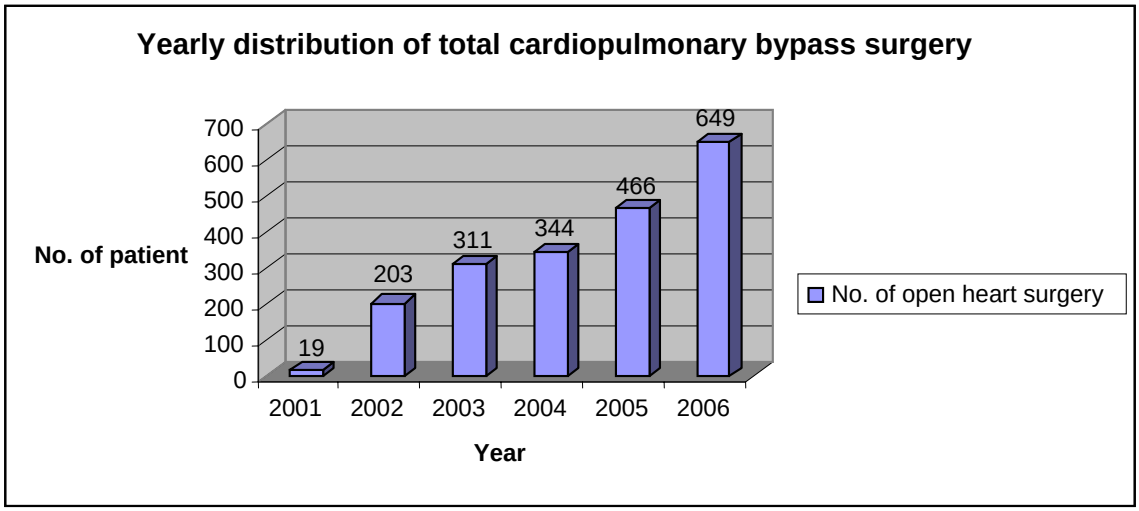
Despite of all the difficulties we are very much keen to develop the subspecialty services like paediatric and adult cardiac anaesthesiology, critical care services, acute postoperative pain management services as well as chronic pain management services of the thorax.

Now we are actively involved in training the post graduate students posted here and hopefully we may be able to start the fellowship program of the cardiac anaesthesiology which may partly solve the problem of the lack of manpower in this field. For this purpose we need help and good will from all sides.

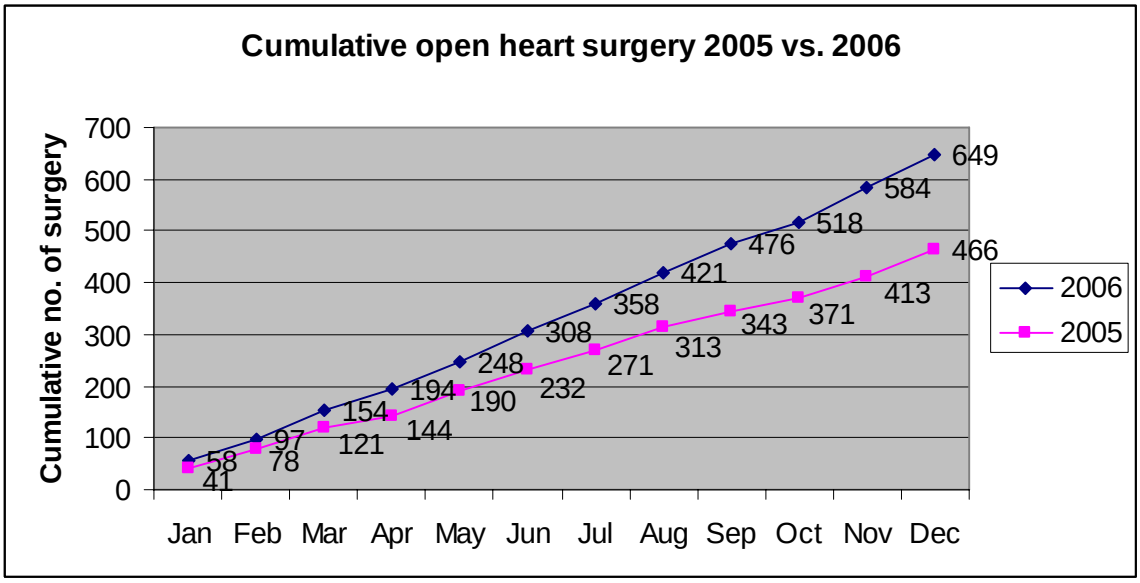
ANNUAL REPORT OF PERFUSION TECHNOLOGY UNIT - 2006

- Satya Narayan Chaudhary,
Senior Perfusionist

The main function of the perfusion technology unit is to run the heart-lung machine which acts as artificial heart and lungs during open heart surgery. In 2006, we ran the heart-lung machine in 649 cases of the total 1012 CV surgeries done here. This is 39.27% increase in the pump cases as compared to the last year. The graph below shows the yearly distribution of pump cases.



Out of the total cases, 45% cases were females and 55% cases were males. The cumulative line chart below shows that there is a significant increase in the total no. of open heart surgery in the year 2006.



There has been a significant increase in the number of pediatric cases this year, due to Children Assistance Program (CAP) launched by the Government of Nepal. Although there is an increase in paediatric cases we used only 21% pediatric oxygenators. This is because of the use of adult oxygenators on older children. We have designed our own custom pack of which in 2006 we used 70% Adult, and 30% Paediatric.

Amongst the cases that required Cardiopulmonary Bypass, 48.69% were Valve, 40.20% Congenital and 8.32% On-pump CABG. There were few combined procedures of which 0.31% was Congenital with CABG, 1.23% CABG with Valve, 0.77% Cardiac Tumors and 0.46% Miscellaneous.

In the year 2006, we introduced Modified Ultra-filtration (MUF) and retrograde autologous priming techniques. We are planning to introduce mini-bypass and close circuit bypass technique in near future. We are in the process of acquiring a new sophisticated heart-lung machine with many safety features.

We are actively participating in academic programs as well. In 2006, Mr. Satya Narayan Chaudhary had presented separate papers on the Annual Conference of Perfusionists of India and Annual Conference of Perfusionist of Great Britain on ***Perfusion Information System***: A Computerized Perfusion Datasheet System.

We provided training in Perfusion techniques to a Doctor from North Korea.

The Perfusion Technology Unit includes the following members:

1. Satya Narayan Chaudhary	Senior Perfusionist
2. Mahendra Bhatta	Visiting Perfusionist
3. Umesh Khan	Perfusion Assistant

MEDICAL INTENSIVE CARE UNIT AT A GLANCE

- Dr. Ranjit Sharma, *Registrat, Cardiology*
- Dr. Udip Dahal, *Medical Officer*
- Dr. C.M. Adhikari, *Medical Officer*
- Dr. N.K Mikrani, *Medical Officer*

Medical intensive care unit (MICU) was established in our center on august 2002. Its primary aim was to provide care for patients with heart failure of various etiologies.

As it had always been in the past year the year 2006A.D too was not an easy going year. The present 5 bedded MICU was in full throttle throughout the year.

Heart failure is one of the leading causes of mortality and morbidity among heart patients. Whether it is due to RHD, DCM, IHD, HTN or CHD, it is still a cause of significant number of hospital admissions.

Besides heart failure, other significant admissions were for cardiac arrhythmias, infective endocarditis, uncontrolled hypertension and post interventional procedures like post PTMC, post pericardiocentesis, balloon pulmonary valvuloplasty, pediatric catheterization and other cath procedures.

The number of MICU admissions was higher compared to that of previous year(a rise by 9.74%).The following table provides a brief review of disease pattern, sex distribution and mortality associated.

Sex Distribution of Diseases

DIAGNOSIS	MALE (%)	FEMALE (%)
RHD	41	58.23
POST PTMC	22.72	77.27
IHD	69.49	30.5
DCM	68.81	31.18

Disease Pattern, Sex Distribution and Mortality Figures

Final Diagnosis	ADMISSION				MORTALITY			
	Male	Female	Total	%	Male	Female	Total	%
RHD IN FAILURE	71	99	170	28.5	12	6	18	10.5
POST PTMC	15	51	66	11.0	1	1	2	3.03
DCM IN CCF	64	29	93	15.6	4	1	5	5.37
IHD IN FAILURE	41	18	59	9.91	0	0	0	0
HYPERTENSIVE HF	10	14	24	4.03	2	1	3	12.5
ARRHYTHMIAS	17	19	36	6.0	1	1	2	5.5
PERICARDIAL EFFUSION	13	9	22	3.69	1	3	4	18.18
CONGENITAL HEART DISEASE	26	33	59	9.91	1	0	1	1.69

COPD WITH COR PULMONALE	6	2	8	1.34	0	1	1	12.5
OTHERS	39	19	58	9.74	3	3	6	10.34
TOTAL	302	293	595		25	17	42	7.05

Most of the heart failure patients in MICU are terminal. Thus many succumb to death even after receiving optimum treatment.

This year the mortality rate is 7.05% which is slightly less than that of the last year. This owes to better level of management in MICU.

CASES which were classified under others included multivalvular diseases (non rheumatic), pulmonary embolism, primary pulmonary hypertension, digoxin toxicity etc. There were a significant number of patients in cardiogenic shock and most of them had to be provided with ventilator support.

RHD with failure still tops the list as previous year with 28.5% of admissions and has mortality of 10.5%.This admission percentage was lower as compared to previous years percentage of 36.5%.

CLINICAL LABORATORY SERVICES IN 2006

- Bodhraj Acharya, *Medical Lab Technologist*
- Rabindra Nepal, *Medical Lab Technologist*
- Drona Raj Pandeya, *Lab Technician*

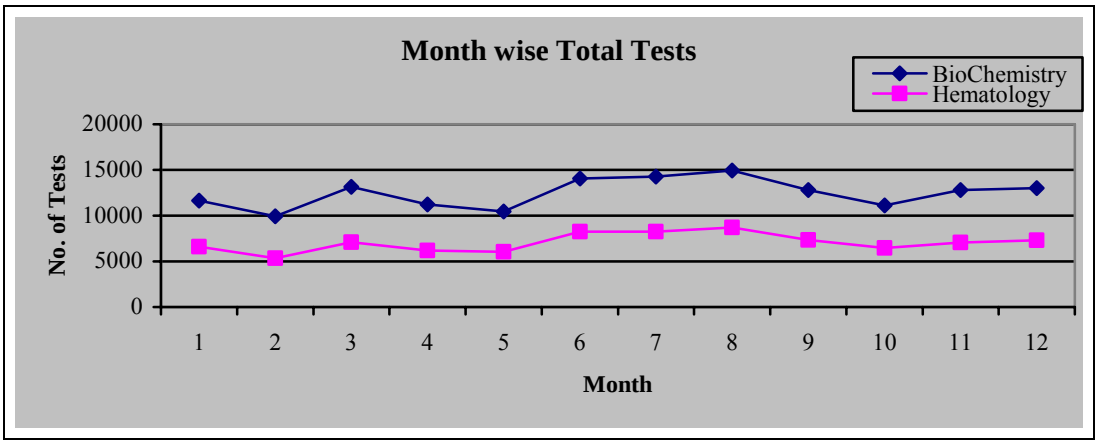
Proper treatment starts with correct diagnosis. Clinical laboratory has crucial role in achieving right diagnosis ultimately leading to best treatment to the patient. To achieve this goal our slogan as in previous years was "Quality for forever with high intension, sincere effort, intelligent direction and skillful execution.

Clinical laboratory services in SGNHC lab is strengthening day by day for quality outcome. In 2006 as well, we were sincerely dedicated for the best possible service to our patients. We want to reiterate our commitment towards better service within available technology in the days ahead.

Panel Wise Test of 2006

Month	Microbiology	Hematology	Coagulation	Biochemistry	Serology	Blood Donors
Poush (Dec-Jan)	83	6596	920	11637	1911	200
Magh (Jan-Feb)	83	5348	716	9917	1618	209
Falgun (Feb-Mar)	117	7083	732	13148	1836	146
Chaitra (Mar-Apr)	98	6200	788	11215	1804	250
Baisak (Apr-May)	67	6066	736	10459	1440	143
Jestha (May-June)	81	8269	951	14055	2321	272
Asar (June-July)	105	8254	941	14264	2160	203
Shrawan (Jul-Aug)	144	8714	943	14947	2202	214
Bhadra (Aug-Sep)	99	7329	798	12807	2005	198
Asoj (Sept-Oct)	87	6485	684	11119	1705	160
Kartik (Oct-Nov)	117	7048	859	12789	2023	243
Mangsir (Nov-Dec)	82	7309	1029	13007	2430	357
Total	**1163**	**84701**	**10097**	**149364**	**23455**	**2595**

Month-wise test plot of Hematology and Biochemistry



Average patients attending lab per day

Patients	Bacteriology	Hematology	Coagulation	Biochemistry	Serology	Blood Donors
Number	3.18	232.05	27.66	409.21	64.26	7.10

What is New in 2006?

Micro-well ELISA based serological tests for screening HIV, HBsAg and HCV and hormonal assays (Free T_3, Free T_4 and TSH) were started in the year 2006 which is different from previously used less reliable and tedious quick methods. Although switch from one step quick method to EIA increase the turn around time (reporting time), the reliability of the produced data made up for the delay. It was found that 50/2595 (1.92%) cases were serology reactive. and 150/558 (26.88%) cases had abnormal hormonal (Free T_3, Free T_4 and TSH) levels. We have started Direct HDL-C and Direct LDL-C and Lipoprotein-a (Lpa) assays routinely which are helpful in managing patients with abnormal lipids. Quantitative estimation of RA factor, ASO and Hs-CRP were started and we are expecting regular test requisition from clinicians for their continuation. Quantitative estimation of ADA has been already started to rule out tuberculosis from other underlining cardiac disease.

Instrumentation in 2006

Window-based Fully Automated Random Access clinical chemistry analyzer from Randox UK was installed this year. The instrument has feature of storing all the reported data for unlimited period of time, advanced IQC monitoring system and the data can be transferred or traced easily. Quantitative estimation of RA, ASO and Hs-CRP was made possible by this machine. Five Part Differential Cell Counter with laser differentiation has been recently installed. The instrument features differentiation plots for precise cellular estimation and advanced IQC monitoring system. Coagulometer (4 Channel for PT/APTT) with scattered light detection method has been installed during the preparation of this manuscript.

Major Gains of 2006

- Switch from Spot to ELISA
- Automation upgraded in Biochemistry
- More advanced (LASER) cellular differention in hematology
- Development of protocols and improved documentation

- Daily QC analysis in biochemistry
- Weekly QC analysis in Hematology
- Regular QC analysis in Coagulation
- RA ASO Quantification started
- HsCRP started
- ADA testing started
- Myoglobin qualitative started
- Testing for antibody of Hepatitis B for all staffs of SGNHC was also done this year

Goals set for 2007

- Blood Component separation: PRP, FFP, Buffy coat, and Packed cells through fully automated component separator will be precedential in Nepalese context
- Coagulation testing: using vacutainers, and scattered light detection technology
- Laboratory LIS and database system
- Lean Six Sigma in QC
- Fully automated ELISA system
- Automation in the microbiology in detection and isolation
- Switch to MIC, MBC level detection of antibiotics from classical Disk diffusion methods.
- Quantification of Troponin I and Troponon T are to be set
- Electronic reporting system

Sophisticated blood donor couch to make blood donation is a unique experience in SGNHC

DIAGNOSTIC AND THERAPEUTIC INTERVENTIONAL PROCEDURES AT SGNHC

- Dr. Arun Maskey,
Consultant Cardiologist

Cardiovascular disease and other chronic, non-communicable diseases were once considered diseases of the industrialized countries; a "*Western disease*" that was solely based on ways of life utterly unknown to populations in Africa, Asia, and many other parts of the developing world. According to the World Health Organization's (WHO) World Health Report 2003, the global health agenda was still dominated by the belief that infectious diseases present developing world a threat than cardiovascular diseases. In reality, deaths from non-communicable diseases are sharply on the rise: the count currently stands at 33 million, but between 1990 and 2020, the number is expected to reach 58 million annually.

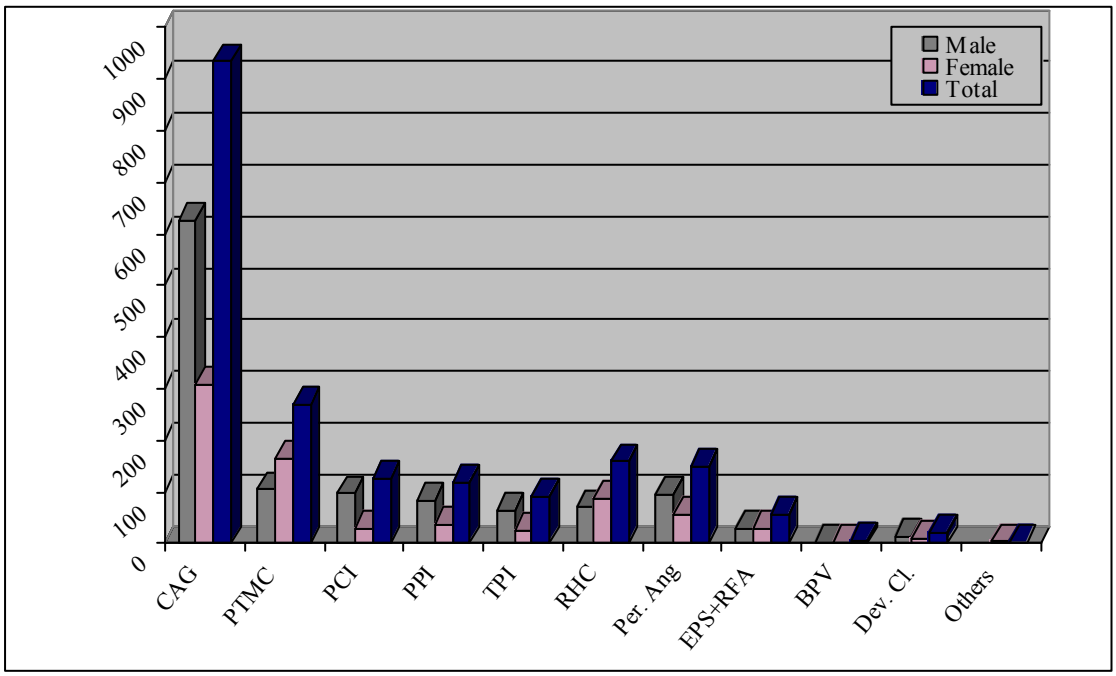
Cardiovascular disease is a global epidemic. CVD is the leading cause of death with approximately 17 million per year, or one out of three deaths around the globe. There are about 200 million people worldwide diagnosed with coronary heart disease, stroke, and diabetes. CVD currently contributes 30.9% of global mortality and 10.3% of the global burden of disease. While deaths from heart attacks have declined more than 50% since the 1960s in many industrialized countries. Currently 80% of global CVD-related deaths occur in low- and middle-income nations. The situation in Asia is bleak: "In India in the past five decades, rates of coronary disease among urban populations have risen from 4% to 11%. In urban China, the death rate from coronary disease rose by 53.4% from 1988 to 1996."

Overall, mortality from CVD has been steadily declining in western Europe, North America, and Japan since the early 1970s. However, trends are not so favorable in Eastern Europe, Asia, Africa, and South America.

Review of cardiovascular disease pattern of admitted case in medical ward of Shahid Gangalal National Heart Centre (SGNHC) show that the most common diseases are ischaemic heart disease, rheumatic heart disease, hypertension, dilated cardiomyopathy and congenital heart disease. SGNHC provides both invasive and non-invasive services. This centre has two state of art catheterization laboratories and well trained interventional cardiologists. SGNHC is routinely providing invasive and interventional procedures, both diagnostic and therapeutics. The procedures performed from Jan 1 to 31 Dec.2006 are shown in figure and table below:

Table: Cath Procedures: 2006

S.No	Procedure	Total	Male	Female
1.	Coronary Angiogram	934	626	308
2.	Percutaneous Transluminal Mitral Commissurotomy (PTMC)	269	105	164
3.	Percutaneous Coronary Intervention (PCI)	126	97	29
4.	Permanent Pacemaker Implantation (PPI)	120	82	38
5.	Temporary Pacemaker Implantation (TPI)	91	64	27
6.	Right Heart Catheterization (RHC)	159	70	89
7.	Peripheral Angiogram	151	94	57
8.	Electrophysiogical Study (EPS) and Radio Frequency Ablation (RFA)	55	28	27
9.	Balloon Pulmonary Valvuloplasty (BPV)	6	3	3
10.	Device Closure	22	13	9
11.	**Others**			
	Balloon Atrial Septostomy	2	1	1
	Renal Angioplasty	3	2	1
	Subclavian Angioplasty	1	0	1
	IVC plasty	1	1	0
	Total	**1940**	**1186**	**754**



Coronary angiogram was most common procedure; it was performed in 934 patients (48.14%). Ischaemic heart disease was the most common cause of hospital admission. Coronary angiogram was done as routine procedure as in unstable angina, non ST elevation MI, stable angina or in those patients undergoing primary percutaneous intervention in ST elevation MI. Of those patients undergoing diagnostic angiogram 126 patients had Percutaneous Coronary Intervention (PCI). Among the 126 PCI patients, 120 Patients had elective PCI and 6 patients had primary PTCA. Rheumatic

heart disease was the second most common cause of hospital admission. PTMC was done in 269 patients (13 .86%). There was female preponderance with female to male ratio of 1.56:1. Right heart catheterization was done in 159 patients (8.2 %). This was done in acyanotic congenital heart diseases like Atrial Septal Defect, Ventricular Septal Defect and Patent Ductus Arteriosus where echocardiography showed very high pulmonary artery pressure and pulmonary vascular resistance (PVR) calculation was necessary to decide preoperatively whether operation was feasible or not. In those patients whose PVR was high and documentation of reversibility with100% oxygen was necessary. Peripheral angiogram was done in 151 patients (7.78 %). The common types of peripheral angiogram were aortogram, renal angiogram, carotid, upper and lower limb vessels. Indications were documentation of MAPCAs and pulmonary artery in Tetralogy of Fallot, Renal Artery Stenosis, Takayasu's disease, peripheral vascular disease etc. Permanent pacemaker was implanted in 120 patients (6.2 %). The most common indications were complete heart block and sick sinus syndrome. Electrophysiology (EPS) with or without Radiofrequency Ablation (RFA) was done in 55 patients (2.83 %). The most common indication for EPS plus RFA was Paroxysmal Supraventricular Tachycardia (PSVT). Balloon Pulmonary Valvuloplasty was done in 6 patients with severe Valvular Pulmonary Stenosis. Device closure was done in 22 patients with Atrial Septal Defect, Patent Ductus Arteriosus and one patient had device closure for post MI VSD. Two new born babies with transposition of great arteries with intact atrium had successful balloon Atrial Septostomy. Three patients had Renal Angioplasty and one each patient had left Subclavian artery angioplasty and IVC plasty.

Complications:

A) Death: 7
- a) Coronary angiogram: 3
- b) Primary PCI in STEMI with cardiogenic shock: 2
- c) Unsuccessful PTMC: 1
- d) Right heart cath: 1

B) Pseudo aneurysm: 2
C) Groin haematoma: 1
D) Femoral artery thrombosis:1
E) Arterio venous fistula : 1

Total no. of complications occurred in 12 patients. Among 3 deaths following coronary angiograms 1 patient had massive retroperitoneal bleeding, second patient had bleeding from vascular malformation of left kidney and had successful embolization of bleeding site and died because of Acute Respiratory Distress Syndrome following massive blood transfusion along with renal failure and the third patient died following ongoing ischaemia in patient who was admitted with NSTEMI. These 3 deaths following coronary angiograms occurred after total 2718 coronary angiograms till date. Total PCI in one year (2006) was 126 with elective PCI in 120 patients and primary PCI in 6 patients. There was no death following elective PCI. 2 patients among primary PCI had acute ST elevation myocardial infarction with cardiogenic shock died because of refractory shock despite successful angioplasty. Literature show that mortality among primary PCI among cardiogenic shock is high and ranges from 42-50%. Our initial experiences in selected patients with acute ST elevation MI with cardiogenic shock show mortality of 50 %. Till date, we had

primary angioplasty with STEMI and cardiogenic shock in 8 patients. Among them 4 patients survived and 4 died. Of one death following PTMC, the patient had severe calcified Mitral Stenosis with pulmonary oedema and rescue PTMC was unsuccessful and died because of pulmonary oedema. A 6 year old boy with complex cyanotic congenital heart disease had right heart catheterization with difficult arterial access. The boy developed thrombosis in left femoral artery with gangrene and died .There was 2 Pseudo aneurysm and one patient had groin haematoma. The young boy after right heart catheterization in Tetralogy of Fallot had thrombosis of access site at right femoral artery and successful embolectomy was done. In general overall complications are low and are acceptable.

Conclusion: Diagnostic and therapeutic interventional procedures are done routinely at Shahid Gangalal National Heart Centre .This is a tertiary referral cardiac centre in the country. With two state of art catheterization laboratories, more and more cardiac patients now have access to such services in the country itself. This centre not only provides routine service but has also started primary angioplasty in selected patients. With more and more confidence and faith shown by patients towards the centre, the numbers of such procedures are increasing every year.

HISTORY OF CARDIAC ELECTROPHYSIOLOGY IN SGNHC

- Dr. Sujeeb Rajbhandari,
- Dr. Roshan Raut,

A dream to initiate and establish cardiac electrophysiology service was looming on our minds since the centre started its cardiac catheterization procedures. The procedures started with right heart catheterizations, followed by coronary and peripheral angiographies, mitral balloon valvotomy and percutaneous coronary interventions. The final stepping stone was cardiac electrophysiological study and radiofrequency ablation.

The field of cardiac electrophysiology was totally new to SGNHC until 2003. The starting point was the visit of Expert Team led by Dr. Ajay M. Naik from India. We decided to select the most straight forward cases like Paroxysmal Supraventricular Tachycardias (PSVT) and WPW syndrome to start with. The team had to teach us literally everything; from the machine, the catheters and the access techniques to the actual procedures of ablations. Dr. Naik's next few visits were important to prepare the venue for real work in EPS/ablations.

In line with the concept of on-the job training, we invited Dr. Thomas Peter, a senior electrophysiologist and the then Director of Cedars Sinai Medical Center, Los Angeles, USA. Our learning curve took an amazing turn in a positive direction when he visited our centre for the first time in March 2005. Despite his age he had zeal and enthusiasm of a much younger person and showed keen interest in teaching. He patiently guided us in the intracardiac ECGs and gave us hands on training. He could go on and on in the cath lab, doing his work meticulously and side by side teaching us, encouraging us to ask him questions. His presence was magnetic and charismatic. He simply loved to teach and spread knowledge to as many as he could. Gradually the mystifying and dreaded intracardiac ECGs began to unfold and fit like a picture of a jigsaw puzzle in our brain. It took us sometime for us to get familiar with the EP machine itself. As we were familiar in operating desktop computers it took us no time to master the EP machine.

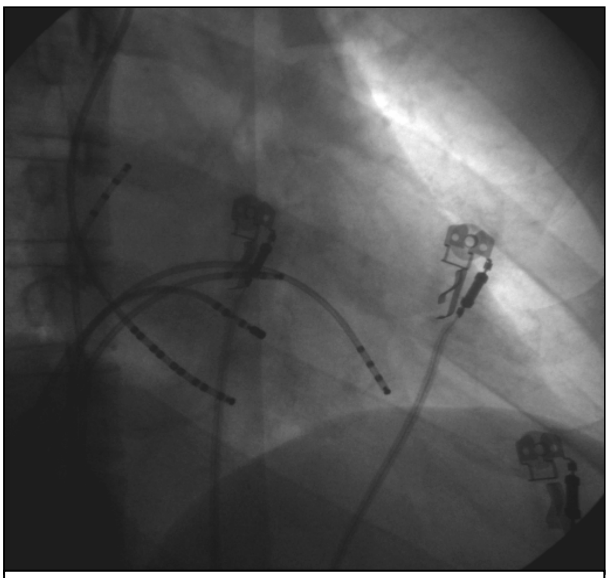


Fig: Fluoroscopic image showing EP catheters inside heart

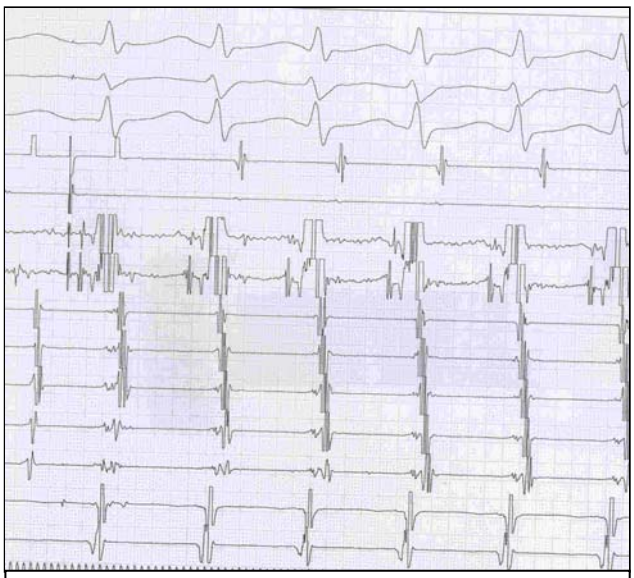


Fig: EP Tracing: Typical Atrio-ventricular Nodal Reentrant Tachycardia

Till date we have done 145 cases of EP studies and RF ablations.

After him came Dr. Jayprakash, in March 2005; an electrophysiologist with an interventional cardiology background from Wockhardt Hospital and Heart Institute, Bangalore. He was not only very quick and confident in doing the cases but also very keen on teaching us and encouraged us to do cases by ourselves.

From the beginning of 2006 we started doing the EPS and ablations ourselves. We carefully selected the cases and try to include patients with ECG features of typical Atrio – Ventricular Reentry Tachycardias (AVNRTs). Till date a total of 34 cases of EPS and RFA are performed successfully by our own team. Out of which 11 had typical AVNRTs and all were successfully ablated. Trains of accelerated junctional rhythm (signifies successful ablation of slow pathway of the AV node) was seen in all of them. One had concealed right free wall pathway which was also ablated successfully. There were two left lateral pathways as well but the ablation attempt was unsuccessful. There were no complications except for one episode of vasovagal attack and two episodes of atrial fibrillation out of which one was defibrillated with 100 Joules of synchronized DC shock. Success specially regarding typical AVNRT ablations have increased our confidence level to new heights.

We are indebted to Dr. Tom Peter and Dr. Jayprakash, without whom it would have been difficult for us to reach the stage which we are right now. A formal training in EPS and RFA in a high volume centre would certainly help us to refine our technique and gain more experience in the field of cardiac electrophysiology and thereby abate the need to go abroad for EPS and ablations

CARDIAC CATHETERIZATION: A GUIDE FOR THE PATIENT

- Dr. Shyam Raj Regmi
Cardiologist

Cardiac catheterization and angiocardiography usually constitute the final definitive diagnostic test for most cardiac patient.

There are a variety of reasons why you may need a heart catheterization. You may have experienced shortness of breath, chest pain (angina), dizziness or irregular heartbeats. Even if you've had no symptoms, your physician may have detected other signs of heart problems. Cardiac catheterization is a diagnostic procedure for evaluating certain problems with the heart and its blood supply.

About the Heart

The heart is a four-chambered muscular organ that pumps blood to all parts of the body. A wall, called a septum, divides the heart into a right and left side. Each side is further divided into an upper chamber (called the atrium) and a lower chamber (called the ventricle). These chambers are separated by valves that open and close to direct blood flow through the heart.

Blood is pumped throughout the body delivering oxygen and nutrients to all cells and organs. The blood then returns to the right side of the heart. From there, the blood is pumped to the lungs where it receives a fresh supply of oxygen. The left side of the heart receives this blood from the lungs and pumps it through arteries to your heart muscle and all other parts of the body. This process continues thousands of times a day with each heartbeat.

Reasons for Catheterization

Coronary artery disease is the most common problem that requires a catheterization or what's known as a "heart cath." Coronary artery disease occurs when the arteries that bring blood to the heart muscle are narrowed by a build-up of fats or cholesterol. Blood cannot flow freely throughout the vessels. This may result in episodes of chest discomfort (angina) or in a heart attack (myocardial infarction). In some cases a heart cath is also needed to check on how well the heart muscle is pumping and how well the valves are opening and closing and for the assessment of the hole in the heart and some by birth defect in the heart.

The procedure involves an injection of dye to see how the blood flows through the vessels of the heart. X-ray pictures are taken of your heart and its arteries to determine if there are any blockages. It is very important that you tell your doctor if you have ever had any x-ray contrast dye allergy. The doctor then can prescribe medication to prevent any allergy symptoms (e.g. rash, difficulty breathing, nausea and vomiting.)

The Week Before

You may need to go to your doctor's office to review your health history and have a physical exam. Blood tests and an EKG will be collected at this time. Patients that are on blood-thinning medications such as coumadin or warfarin should contact their doctor five days before their procedure date for instructions on how to take their blood-thinning medication. Most patients are asked to stop warfarin or be changed to a different medication until their Heart Cath is complete. Patients who have been taking blood-thinning medications will need another blood test just prior to their Heart Cath to make sure that blood clotting has returned to normal.

The Night Before

- Do take all your usual medications including a full dose aspirin (325mg) unless you have been instructed otherwise.
- Do not eat or drink anything after midnight except a small sip of water with your morning medications.
- If you are a diabetic, take your usual medications at night, including insulin (usual prescribed dose), but do not take ORAL diabetic tablets, and if you take Morning INSULIN only take HALF of your usual dose. Nursing staff will check your blood sugar on your arrival if necessary.

Planning Your Travel To and From the Hospital

- It is important that you arrange for someone to drive you to and from the hospital. You will not be allowed to drive your self home, take public transportation or a Cab.
- After your procedure is completed, you may be discharged (usually several hours later) or be admitted to the hospital overnight, depending on the outcome of your test. Your doctor will tell you and your family the discharge plan immediately after the test.

Your family is welcome to accompany you and remain with you in the Recovery Room before your procedure, and to visit with you in the Recovery Room after the procedure. During the procedure itself there are several waiting areas nearby where they will be asked to wait and be available if necessary. Your doctor will meet with them immediately after your procedure.

Arrival in the Catheterization Laboratory

On the day of your heart catheterization you should go to the Admitting process through emergency desk in our hospital. You will then be brought to the Cardiac Recovery Waiting Room. A nursing staff member will call for you and escort you to the Recovery Room. Your family will be asked to wait in the waiting room initially until the nursing staff has had time to prepare you for you procedure. They may then rejoin you in the Recovery Room until it is time for your procedure to begin.

Once in the Recovery Room you will be asked to use the restroom and change into a hospital gown. Please remember to wear no jewelry and to leave valuables such as money and credit cards at home or with your family.

Preparing for Your Heart Catheterization

In the Recovery Room you will have an intravenous (IV) line started in your arm or hand. The IV will be used for giving you fluids and medications before, during, and after your procedure. The nursing staff will interview you, asking questions to complete your medical history.

In preparation for the Catheterization an arterial site will be prepped. The site, either your groin or wrist area, will be shaved. Removing the hair from the area decreases your risk for infection. Please remember no jewelry on your arm or hand.

- A member of the Catheterization team will explain the procedure and ask you to sign a consent form before the heart catheterization.

During Your Heart Catheterization

- A cardiac nurse will be assigned to you and will be with you during your procedure. The nurse will meet you in the Recovery Room, briefly discuss your procedure, and answer any remaining questions you may have prior to entering the procedure room. Along with your doctor and nurse, other important members of the catheterization team include: A Radiology Technologist, who assists in moving the X-Ray table and with other specialized equipment; A Cardiovascular Technologist who assists with the monitoring equipment; and an assistant doctor or cardiology fellow (cardiologist-in-training) who will assist your doctor during the procedure.
- The procedure room is cold, because the equipment used for your catheterization requires a cool environment.
- Warm blankets will be provided.
- The team will request that you verify your name, and the procedure you are scheduled for. This is required for all medical procedures, and ensures safety to our patients.
- Once you are on the X-ray table, you will lie on your back with a pillow under your head. The nurse may administer medications called “conscious sedation” through your IV line if necessary. This combination of medications helps you relax and become drowsy, while still being able to talk, answer questions, and follow instructions (such as holding your breath, etc). A member of the team will then begin to prep your skin with a special sterile soap.

We ask that you please keep your hands by your side as the area is sterile and your hands could contaminate the area being prepped, increasing your risk for infection. A large sterile sheet will then cover you, to provide warmth and to maintain a sterile area.

- Next you will receive some local anesthetic similar to what your dentist may use, to numb your skin. After the anesthetic is given, you should only feel pressure at the site of the procedure in your wrist or groin. Please let the team know if you have any significant discomfort. The catheters the doctor uses are similar to a large IV catheter. You should not feel pain once the catheter is placed, and you will not feel the catheter moving inside your body. When the catheter is in position, measurements will be taken, and contrast dye will be

injected. At this time the doctor and radiology technologist may ask you to move your head from side to side, or take a deep breath as the table and camera move to take pictures of the heart from different angles. It is not unusual for you to feel some warmth in your chest, arms, or elsewhere for a few seconds as the dye is injected.

- A full heart catheterization is usually complete in 30-40 minutes. When the Catheterization is complete, your doctor will discuss with you the results and will contact your regular cardiology doctor. At that time a treatment plan will be discussed and further treatments or procedures explained below will be recommended. Sometimes these procedures are then done immediately in the same procedure room.

Angioplasty and Stenting

If you need an angioplasty to open up a blocked artery, it will usually be done immediately or planned for next visit. During Percutaneous Transluminal Coronary Angioplasty (PTCA) a very thin wire and then a small balloon are passed across the blockage in your heart vessel. The balloon is inflated to compress the plaque (cholesterol buildup). The balloon is then deflated and the blockage is improved. While the balloon is inflated, you may feel some chest pain much like angina. This pain is only temporary and will go away once the balloon is deflated.

Most patients who undergo angioplasty also have a metal tube, or stent, placed within the artery to hold it open. These stents remain permanently within the artery after the procedure. Most stents now have a medication on their surface which is gradually released from the stent during the first few days or weeks. This medication greatly reduces the scarring that follows stent placement, and therefore keeps the stent open better and longer. Special medications to prevent blood clots within the stent will be started before or right after your procedure, and continued for at least several months. These mild blood-thinners are of great importance to take regularly. Every effort should be made not to miss or skip even a single dose.

The total time needed for your procedure and hospital stay will depend on what procedure is done. If you do have a coronary intervention (such as PTCA, stent) you will be transferred to a CCU and must lie flat on your back for 4-12 hours, depending how long then entry site takes to heal. If the procedure is done through the radial artery in the wrist, a device called a “hemoband” is applied to hold pressure and prevent bleeding at the site and will remain on for 2 to 4 hours. If the procedure is done through the wrist or arm, you may sit up shortly after the procedure but must keep the arm still for at least 4 hours.

After Your Catheterization

After your catheterization you will either return to the Recovery Room, or be taken directly to an inpatient ward. Your doctor will meet with your family immediately so that they know where you will be and can see you right away. The catheter in femoral or radial artery will be pulled out of the artery in the Recovery Room. This part of the procedure is not usually painful but you might find it uncomfortable. You then will have to lie flat on your back for six hours after the procedure and the nurses will

monitor you carefully. They will check your blood pressure and check the pulse in your feet and legs often.

If the catheterization was done from the leg artery, you must remember not to bend the leg at the hips. That means you cannot bend your knees to try to sit up, but the head of the bed can be raised a little so you can eat and drink. If you need to go to the bathroom during this time you will have to use a bedpan or urinal. If the procedure was done through the wrist or arm, you may not use them to eat, drink or hold anything and you will be given further instructions to care for that site at time of discharge. When the procedure site is sealed, you will be asked to walk to make sure you do not have any bleeding or swelling. If there are no complications, you will be allowed to go home.

You will also meet with different members of the staff to review in detail your medications and treatment plan before you leave. It is very important for you and your family to understand these instructions to prevent any problems at home. That night we ask that you relax and have a quiet evening at home either lying down or reclining in a comfortable chair. The next morning you can shower and go back to your normal routines, but do not start any vigorous activity for another full day. The area where the catheter was inserted will sometimes feel and look bruised. There will be a small cut in the skin that feels sore. You can wash this with soap and water and leave it open to air or cover it with a bandage if that's more comfortable. You will notice a small bump under the skin. This may last for weeks but it will eventually disappear. If you notice any other swelling, redness, bruising or pain in the area call your doctor or go to your local emergency room.

We want to know that you are well and safe after your procedure and return home.

CORONARY ARTERY DISEASE IN YOUNG PEOPLE

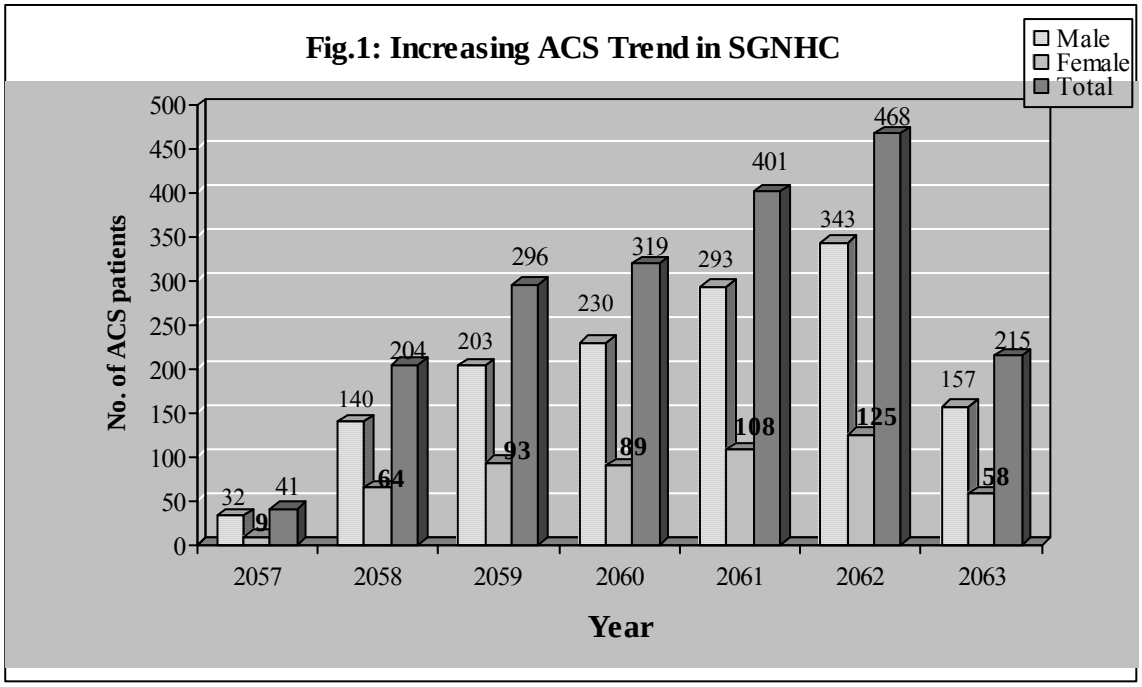
- Dr. Man Bahadur KC, *Sr. Consultant Cardiologist*
- Dr. Roshan Raut, *Registar, Cardiolgogy*

It has been shown in western population that more and more young people are getting coronary artery disease. The same scenario has been observed in our CCU in the recent years. However, in our country, there is no any formal data regarding this issue. So, we have conducted the retrospective analysis of patients with Acute Coronary Syndrome who were admitted in SGNHC from 9 Jestha 2057 to 20 Bhadra 2063. There were altogether 1944 ACS patients. Male preponderance was clearly seen as 71.9 % (1398) were male and only 28.1 % (546) were female. The mean age was 60 years, male 59 years and female 63 years (Table 1). There was dramatic increment in ACS patients from year 2057 to 2063 (Figure 1). However, there was no significant difference between male female ratio since 2057.

Table1: Demographic features of study population

Total No. of Pts	1944
Male	1398 (71.9%)
Female	546 (28.1%)
Mean age (Yrs)	60.39 ± 12.58
Male	59.31 ± 12.43
Female	63.17 ± 12.55

Fig.1: Increasing ACS Trend in SGNHC



There was significant decreasing trend in mean age; 61 years in the year 2057 and 58 years in the year 2063, (p=0.002), figure 2. Increasing trend of young patients with ACS (<45 years) is seen since 2057, figure 3 (P=0.004).

Fig. 2: Decreasing pattern of mean age since 2057

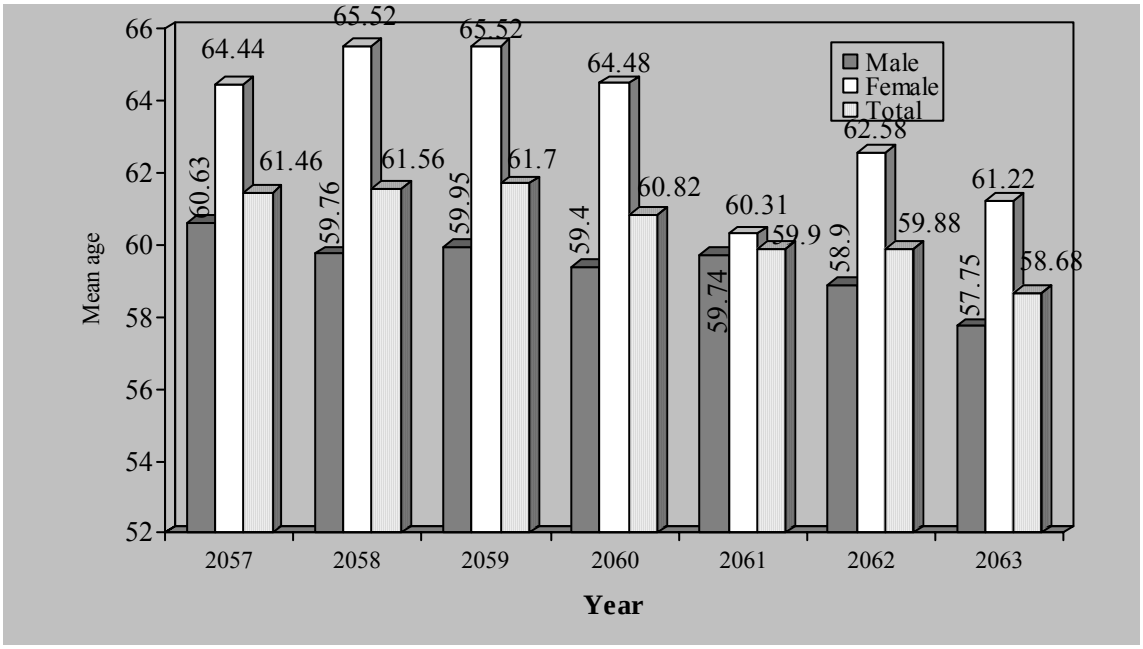
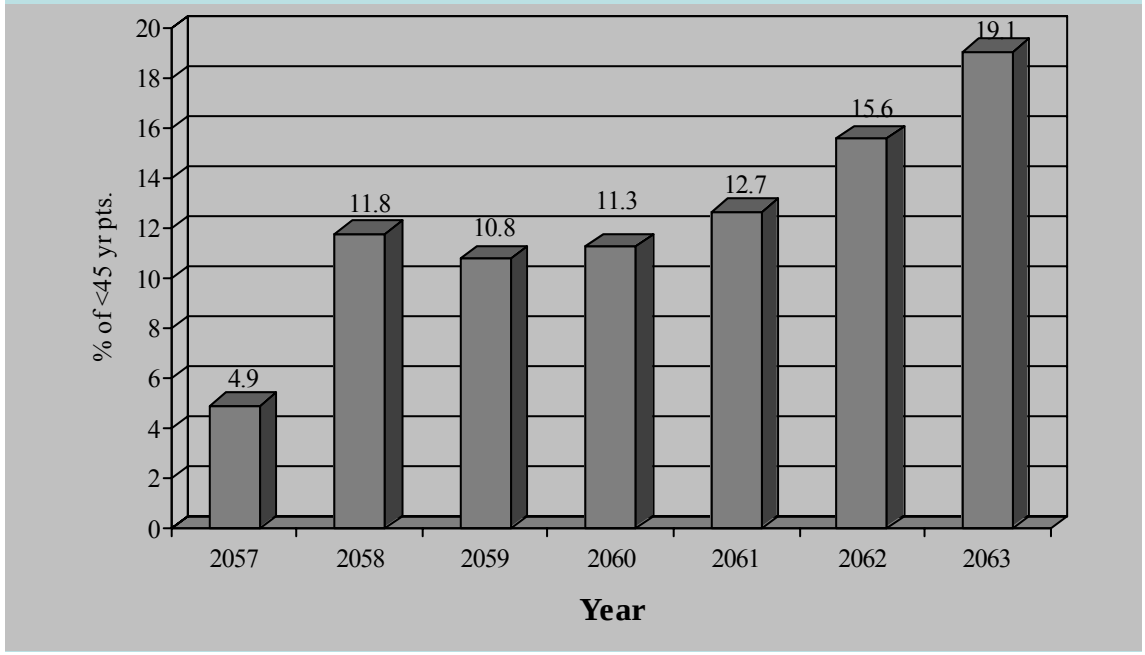


Fig. 3: Increasing Trend of Younger ACS Patients Admitted in SGNHC



Among all the patients admitted in SGNHC, 14% of male and 10% of female were less than 45 years. Thus, according to the current definition of premature CAD, almost 19.5 % of all ACS patients were turned out to be premature CAD.

Table 2: Age wise distribution of ACS patients

	≤45 Yrs (%)	46-55yrs (%)	56-65 yrs (%)	≥66 Yrs (%)	Total
Male	201 (14)	342 (24)	417 (29)	438 (31)	1398
Female	58 (10)	121 (22)	153 (28)	214 (39)	546
Total	259 (13)	463 (23)	570 (29)	652 (33)	1944

Premature CAD (Male<45 yrs & Female < 55yrs)	19.55%

The reason behind the increasing number of young CAD is still unclear. The possible explanation might be due to modifiable risk factors, which has not been controlled, especially smoking. Moreover most of the young male ACS patients were heavy smokers. Apart from the traditional risk factors, there might be other non-identified or un-established risk factors in these patients. Further, it should be noted that some younger CAD might have non-atherosclerosis pathology, like Kawasaki disease, embolic event, vasculitis, connective tissue disease etc. Thus detailed diagnostic examinations regarding some risk factors like hsCRP, LPa, Homocysteine as well as search for non-atherosclerotic pathology would be helpful in these patients.

ATP III has defined age more than 55 years in male and more than 65 years in female to be a cardiovascular risk factor. But, it has been observed that there are significant proportions of younger people who are vulnerable to coronary artery disease. Therefore, although older people have higher probability of getting CAD, younger people also do bear certain risk. And thereby, the focus of primary prevention should not only be elderly people, but also younger people.

PUBLIC PERCEPTION OF A HEART ATTACK

- Dr. Yuba Raj Limbu
Cardiologist

A projected rise in a global cardiovascular death is anticipated over the next coming decades. Coronary Heart Disease (CHD) is a leading killer among all cardiovascular deaths. More than a million Americans experience a heart attack each year and more than one third of them are fatal.[1] A global death from CHD alone is accounted more than 7 million people each year.[2] By 2020 it is predicted that CHD mortality surpass infectious disease mortality and will claim 25 million lives annually around the world.[3] The dramatic rise in mortality due to heart attack over the next coming decades warrants public prompt awareness and recognition of heart attack signs and symptoms for the prevention of preventable deaths due to time delay.

Heart attack risk factors:
Certain known risk factors comprise the peril of majority CHD and heart attacks. Some of those risk factors are modifiable and some are not. In men after the age of 45 and in women after the age of 55 the risk of heart attack increases significantly. Family history of early CHD and heart attack, father or brother diagnosed before the age of 55 and mother or sister diagnosed before the age of 65, is also responsible to increase the risk of heart attack. Ethnic vulnerability will be defined more clearly in future. Despite those some non-modifiable risk factors, many of the CHD and heart attack risk factors are modifiable. Hypertension, diabetes mellitus, hypercholesterolemia, obesity, cigarette smoking and sedentary life style are modifiable risk factors. Some of those risk factors contribute independently, and some enhances the risk of heart attack. A presence of a cluster of these risk factors indicates the high risk of CHD and heart attack.

Signs of a heart attack:
Many of the heart attack signs are not typical as depicted in a commercial mass media. Almost one fourth of heart attack events occur without feeling of chest pain.[4] Chest pain, shortness of breath, feeling feverish, nausea or vomiting, and sweating are warning signs of heart attack. Some heart attacks are severe and intense, while some occur with only mild chest discomfort. Chest pain or radiating pain to arm, shoulder, neck, jaw or back, shortness of breath, nausea or vomiting, sweating, light headedness and weakness are most described heart attack symptoms. Warning signs and symptoms of heart attack varies in each individual.

Public knowledge of a heart attack;
Generally, knowledge of heart attack is perceived through mass media in general population. Mass media in which heart attack is depicted as a sudden and intense event that causes to a person collapse and probably die.[5] There is a widespread myth of heart attack deaths in general population. Lay public heart attack awareness is not adequate and knowledge of heart attack signs and symptoms is deficient.[6-8] Chest pain or discomfort is the most commonly named heart attack sign or symptom by the general population of economically established regions,[6,7,9] whereas chest pain is reported as a second a second most common heart attack symptom preceded by fainting or collapsing named by lay public of a developing country like Nepal.[7] Chest

pain, shortness of breath, dizziness, sweating, palpitation, lethargy, nausea or vomiting and fainting or collapsing are the symptoms of heart attack named by general public. Interestingly Nepalese general population could not report any radiating pain,[7] while more than 50% participants of established economy region reported radiating pain (arm pain or numbness, jaw or neck pain etc) of heart attack.[6,9] Only 22.4% of Nepalese participants could identify chest pain as a heart attack symptom,[7] whereas more than 75% respondents of developed part of the world could identify chest pain as a heart attack symptom.[6,9,10] In reality majority of heart attack patients seek medical care with the complaint of chest pain. In one study [10] it is reported that a mismatch between symptoms experienced and those expected occurred in 58% of population and 12.5% had no idea of what a heart attack would be like. In our study,[7] 21.3% participants who were aware of heart attack could not name any heart attack symptoms. Gender and ethnic difference on the recognition of heart attack is also reported.[11]

Overall public can name different heart attack symptoms, but the knowledge of the complex constellation of heart attack symptoms is deficient in general population. An individual may experience either single or a cluster of heart attack signs and symptoms during acute onset of heart attack. Sometimes heart attack symptoms may be severe and intense and sometimes it may be mild discomfort. Severe and intense events draw attention of patient and helpers to seek the urgent medical management, but mild discomfort or some atypical warning signs of heart attack cause unnecessary delay to hospital arrival time to seek medical management. Sometimes heart attack symptoms are misinterpreted[5], and some patients underestimate the seriousness of symptoms and wait for symptoms to go away.[12]

Early management, either medical (thrombolysis) or invasive strategy, and restoration of coronary patency greatly reduces the mortality. Both medical and invasive strategies are time dependent. If the time of presentation is less than 3 hours after the onset of heart attack, then the effectiveness of either therapeutic strategy is similar. So the patient's perception of heart attack warning signs and symptoms and treatment seeking behavior play a paramount role for the time dependent management of heart attack. Previous studies [6-9] have documented lack of heart attack awareness and the knowledge of wide range of heart attack symptoms in general population. A modestly successful in increasing the general public's knowledge of the complex constellation of heart attack symptoms was described in a community intervention trial.[13] Public health educational programs are warranted to increase the heart attack awareness and knowledge of heart attack symptoms to decrease the fatalities caused by delay in presenting at a hospital after the acute onset of heart attack symptoms.

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THE KNOW HOW OF CARDIAC ELECTROPHYSIOLOGICAL STUDY

- Dr. Sujeeb Rajbhandari
Cardiologist

The History

Many patients do not have a strong idea as to why they are having an Electrophysiological (EP) study done. Some patients may say "I have WPW". Most of the time, however, the patient will not present with such specific information.

"Why are you having this test?" / What type of symptoms have you been having" – Many patients who come to the catheterization lab are not certain of exactly what is going on, but most of them can tell you very clearly what type of problems they have been having. The patients may complain of "palpitations, dizziness, light headedness, racing heart rate, nervousness, thumping in my chest, almost fainted and feeling weak or tired".

"How often this happen?" – Someone who has one or two episodes every few months or more is probably an SVT patient.

"Have you ever passed out from this?" – For suspected SVT, syncope or near syncope may indicate that the arrhythmia may conduct very fast.

"How old were you when this first happened?" – Patient in their teens or early twenties points towards bypass tracts (e.g. WPW).

"How long these episodes last?" – Generally speaking ventricular arrhythmias are of shorter duration. SVT due to bypass tracts is often faster than Atrio – ventricular nodal reentry (AVNRT) and is not tolerated well.

Inside Cath lab

The patient is brought in fasting non sedated state into the Cath lab. As Sedation may make it difficult to reproduce the patient's arrhythmia, so it is given only when the physician specifically requests it. It should be noted that there will be patients that come into lab in an extreme state of anxiety. They may be afraid almost to the point of panicking. So intensive pre procedural counseling is required and confidence building measures should be taken. They should be reassured and be told that they would be fully awake during the procedure and it can take hours and they have to remain calm. They should also be informed that during the procedure, generation of arrhythmia is inevitable and is extremely important during the study. It can occur inadvertently during catheter manipulation and also during programmed stimulation and may cause sudden thumping of the chest.

Once the patient is on the table, they will be hooked up to twelve lead surface ECG. An electrode back patch is placed behind the back of the patient. The patient's right, left groin and right neck are cleansed with antiseptic solution and draped. Local

anaesthesia (Lignocaine) is infiltrated in an around the above mentioned areas prior to the catheter insertion. Vascular sheaths are inserted as done during coronary angiogram. About five electrophysiology catheters are inserted via the venous (and sometimes the arterial system). The catheters defer from the coronary catheters as they are not hollow. The ablation catheter is slightly larger than the rest. The basic positions of the catheters inside heart are; Right atrium, His bundle region, Right ventricular apex and Coronary sinus. The catheters have multiple poles (Temporary pacing leads have two). Commonly used are quadripolar catheters (four poles) and for coronary sinus, decapolar (10 poles) are used. The catheters are connected via interphase cables to one or more (commonly two) junction boxes which serve as an junction point between the catheters and the EP machine. The EP machine consists of three parts; namely: Stimulator, Ablator and a Computer.

During the entire procedure the patient will have to lie still on the cath lab table. The electrophysiologist will be doing his part. He will measures various intracardiac intervals, induce and terminate arrhythmias. Study the mechanism and onset of arrhythmias generated. Finally localize the bypass tract or slow pathway of AV node using both surface ECGs, intracardiac ECG signals and multiple fluoroscopic views and ablate using radiofrequency waves. The entire procedure is almost painless and carries less of a risk when compared to Percutaneous Coronary Interventions. During application of radiofrequency burn some patient may feel slight pain.

Cardiac electrophysiological study and radiofrequency ablation is one of the most rewarding procedures in the Field of Interventional cardiology with success rates close to 100% in most forms of Supraventricular Tachycardias.

HOSPITAL CARE AND THE CORONARY CARE UNIT (CCU)

- Dr. Roshan Raut,
Registrar, Cardiology

Most patients suspected of having an acute heart attack are admitted to a hospital's coronary care unit (CCU). The CCU is intended to be a quiet and calm area in which patients can be further evaluated and closely monitored. Specially trained nurses who work with doctors and other members of the medical team provide individualized care. Visiting hours are usually restricted.

The length of stay in the CCU varies, depending on:

- Whether or not the diagnosis of a heart attack is confirmed
- The severity of the heart attack
- The presence and severity of associated complications

A patient with a heart attack without complications spends about two to three days in a CCU before being transferred to a step-down unit once they become stable. The patient usually goes home five to seven days after hospital admission.

What Are The Goals Of Care In The CCU?

Care in the CCU focuses on:

- Relief of chest pain and anxiety
- Further assessment (diagnostic tests) to confirm a diagnosis
- Limiting the size of the heart attack and the area of heart muscle that dies
- Reducing the work of the heart
- Identifying, preventing, and treating complications from the heart attack

In the CCU:

- Care for the patient which was begun in the emergency setting is continued
- Additional diagnostic tests are ordered
- Doctors determine if a patient needs an angioplasty
- The patient's level of activity and diet is restricted

What Tests And Treatments Occur In The CCU?

ECGs: In addition to the continuous ECG monitoring, 12-lead electrocardiograms (ECG) are obtained to help confirm the diagnosis of a heart attack. Repeat ECGs also help to identify evidence of ongoing ischemia, which is insufficient blood flow to heart muscle or other complications.

Blood tests: Further blood samples are also obtained every six to eight hours for 24 hours to measure cardiac enzyme levels. Increased levels of certain cardiac enzymes suggest the presence of damage to heart muscle and are an important means of

confirming a diagnosis of a heart attack. Apart from this, lipid profiles, blood sugar and renal function tests are also done.

Additional diagnostic tests may include:

- Echocardiography
- Cardiac catheterization/coronary angiography

Treatments

- Use of medications such as nitrates, beta blockers, and angiotensin converting-enzyme (ACE) inhibitors to reduce the work load of the heart. This is one way of limiting the size of the infarction (region of dead heart muscle cells).
- Use of thrombolytic clot busters drugs to clear a coronary artery that has been blocked by a blood clot
- Use of antiarrhythmic drugs to treat arrhythmias, which are abnormal heart rhythms.
- Use of a pacemaker, a machine that regulates heart rhythm.
- Use of medications for an abnormally slow heart rhythm (bradycardia) or low blood pressure (hypotension) due to a block in the transmission of the heart's electrical impulses.
- Use of anticoagulants, medications that made the blood less sticky and less likely to clot. These can be used in combination with clot buster drugs or to prevent blood clots from forming in the heart chambers or leg veins after a heart attack.
- Use of medications to treat heart failure if signs of heart failure are present. These include shortness of breath due to fluid in lungs and/or leg swelling.

Depending on the results of these diagnostic and therapeutic procedures, some patients are identified as needing treatments other than medications, including:

- Coronary angioplasty
- Coronary artery bypass surgery

Diet and Activity Levels

Additional precautions taken during the stay in the CCU and step-down unit, include

- Restricting the diet

  For the first 24 hours, the patient is placed on a clear liquid diet to reduce the possibility of aspiration due to nausea and vomiting. A healthy food plan, including complex carbohydrates and fiber-rich foods, is later introduced. All individuals who have suffered a heart attack need to permanently adopt a healthy diet.

- Limiting activity levels

  All patients are initially placed on bed rest. Patients who are stable, free of pain, and free of complications are sometimes to get out of bed to use the

commode. Patients who remain free of complication often begin limited physical activities within 24 hours.

Progression of Activity

Days 1-2

- Sitting up with feet dangling over the side of the bed
- Lifting and lowering of the arms, called range-of-motions exercises, to prevent muscle and joint stiffness and to prevent blood clots from forming in the legs

Days 3-4

- Bathing and dressing while sitting on the bed or in a chair
- Taking short walks around the hospital room
- Taking supervised walks outside the hospital room
- Showering without shampooing hair (no raising of arms above head)

Days 5-7

- Walking about 600 feet three times a day
- Shampooing hair (activities with arms over the head)
- Climbing stairs with supervision
- Undergoing an exercise tolerance test

After several days in the hospital, a patient with an uncomplicated heart attack can go home. Physical activity is then gradually increased over the next three to six weeks. Doctors may recommend the patient attend cardiac rehabilitation.

DTC AND ITS ROLE IN ENSURING DRUG QUALITY

- Babu Ram Adhikari
Pharmacist

Hospital pharmacy practice in Nepal is not so developed. Today, in Nepal, drugs are irrationally prescribed, dispensed and used resulting in drug related problems of various magnitudes. It is broadly observed that 5 to 10 per cent of the cases admitted in hospitals, especially amongst elderly, are due to drug related problems. Good pharmacy practice minimizes drug related problems in the hospitals to a great extent.

Nepal lacks an effective drug regulatory system, which highlights how important are the prescriptions, the dispensers on deciding the quality of pharmaceutical products. There are numerous reports of an unacceptable prevalence of substandard and counterfeit pharmaceutical products in international trade. Nepal being one of the most frequently exposed countries to such products. Due to rising numbers of drug related problems; first need is to focus on the quality pharmacy services to the patients.

Drug and Therapeutics Committee (DTC), also called Pharmacy Committee is a vital body designated to ensure the safe and effective use of medicines in the facility (Hospitals/Health Centers) or area under its jurisdiction.

The committee

> evaluates the clinical use of drugs,
> Develops policies for managing drug use,
> Administers and manages the formulary system.

Functions of a DTC

DTC works to ensure better quality of care and rational use of drugs through:

- Advising medical, pharmacy & administrative staff,
- Developing drug policies and procedures,
- evaluating and selecting drugs for formulary,
- Assessing drug use problems,
- Promoting interventions to improve drug use,
- Managing ADRs and medication errors

1. Advisory Functions of a DTC

- Advise medical, administrative, and pharmacy departments,
- Advise and support other hospital organizations on drug-related issues,
- Participate in hospital committees and departments on all matters concerning drugs

2. Drug Policies and Procedures

- The DTC has the most expertise to develop policies on:
  - New, non-formulary, restricted, investigational drugs
  - Generic substitution and therapeutic interchange
  - Standard treatment guidelines (and other interventions)
  - Structured order forms,
  - Interventions to promote more rational use of drugs
  - Drug promotion

3. Evaluation and selection of drugs for the formulary

- Explicit evaluation criteria include
  - Efficacy, relative efficacy, effectiveness
  - Safety, quality, cost
- Consistent decision-making includes
  - Evidence-based, local context, transparency
- Evaluation process uses current literature including
  - Primary literature (especially randomized controlled trials)
  - Published standard treatment guidelines
  - Pharmaco-economic studies
  - Review articles
  - Reliable and current tertiary sources (text books)

Benefits of an Effective Formulary System

- Approved and efficacious drugs that all practitioners will have available for use
  - > Only the most effective and safe products
  - > Drugs that have been evaluated systematically
  - > Physicians develop greater experience with fewer drugs
- Drug therapy at lower cost
  - > Ineffective, high-cost drugs will not be available
  - > Availability of most-effective drugs leads to improved outcomes and lower cost
  - > Reduced inventory cost
- Consistent supply of drugs
  - > Regulating the number of drugs will improve procurement and inventory management

4. Managing adverse drug reactions & medication errors

- **The DTC also has role in managing ADRs by planning to:**
  - Monitor
  - Assess
  - Report
  - Correct the problem if possible
  - Prevent future problems

Ethical Considerations for the DTC

- Pharmaceutical manufacturers can be very influential on this committee so the committee must remain unbiased and transparent at all times to maintain credibility.
- There should be no relationship with a manufacturer or supplier other than the acquisition of quality drugs and the exchange of unbiased drug information.

MODERN CONCEPT OF MANAGEMENT

- Krishna Kumari Subedi
Sister In-charge, OT

"Management is art of getting things done through people."

Management is that field of human behavior in which managers plan, organize, staff, direct, and control human, financial resources in an organized group effort in order to achieve desired individual and group objectives with optimum efficiency and effectiveness.

In the past, management was not considered as an important part of development. With industrial revolution during 17^{th} and 18^{th} century, several economists expressed their 'concepts and function of management'. Only in 19^{th} century, management became the separate field of study because business organization faced various problems regarding labour efficiency and wage payment system. In search of solution of these problems, people began to recognize management as a separate field of study.

TRENDS IN MANAGEMENT

Trends in Management means movement of management thought in particular direction. Management thought developed gradually, from past to present and passed through various distinct phases.

1. The a classical theory. It mainly consists of 3 theories
    - Bureaucratic theory.
    - Scientific management theory
    - Administrative theory.

Concerned with production of efficiency and productivity through the one best way. Scientific method should be used to define the best way. There should be standardization.

2. The neoclassical theory

    - Human classical theory
    - Behavioral theory.

Concerned with importance of human element in management, the theory emphasizes importance of individual within the organization. According to human relation, theory productivity is not only technical but also a social phenomenon. Workers' attitude govern productivity. Workers are motivated by social need. They respond to pressures of informal work groups. Money is not the only motivator. Workers are social and they advocated that people are different than machines.

3. Modern organizations theory (The system theory and contingency theory)

- The system theory- concerned with total picture of interdependence and environmental influences.

- contingency theory concerned with inquires of each situation for managerial practice

The modern organizational theory is regarded as recent development in management theory. They represent integrative approach to management. There is no one best way of doing things under all conditions. Methods and techniques which are highly effective in one situation may not work in other situations. Situation plays an important role in application of management function. Functions are universal but their application is situational. Management takes a situational approach.

IMPORTANCE OF MANAGEMENT

1) Acquisition and utilization of resources
   Management performs efficient acquisition effective development and utilization and proper coordination of resources.

2) Environmental adaptation.
   Management adopts organization to changing environmental forces.

3) Goal achievement
   Management achieves goals by balancing the requirement of jobs and people.

4) Problem solving.
   Management solves organizational problems. It identifies and evaluates various alternatives and choose appropriate course of action.

5) Performance control.
   Management measures and evaluates the actual performance.

6) Social responsibility
   Management anticipate and act before hand to social expectations.

FUNCTION OF MANAGEMENT

1. Planning
2. Organizing
3. Staffing
4. Leading
5. Controlling

1. Planning

Planning is setting goals and deciding how best to achieve them. Planning is predetermining future. Planning is deciding in advance about what to do how to do it when to do it and who is to do it.

2. Organizing

Organizing is establishing structure. It includes grouping tasks, producing authority – responsibility structures creating channel of communication and creating coordinating mechanism.

3. **Staffing**
   Staffing is hiring and assigning people to carry out tasks. It is filling and keeping filled positions in the organization structure. It is human resource management.

4. **Leading**
   Leading is influencing, communicating and motivating people to perform tasks for goal achievement.

5. **Controlling**
   Controlling is maintaining, comparing and correcting organizational performance toward goal achievement

EMERGING CHALLENGES FOR MANAGEMENT

1. Globalilization: Managers need to think globally and act locally.
2. Technology: The new economy will base on digital revolution. The development in information technology will provide greater access to management. Management will need to manage changing technology effectively.
3. Quality: Quality assurance is getting important.
4. Social responsibility: Management will pursue long term goals that are good for society.
5. Empowerment: To empower worker is a challenge to management.
6. Human resource management: Management needs to deal with diversified work force, requires visionary leadership on the part of management.
7. Organization design: Organization will be lean flat and less hierarchical
8. Cultural sensitivity: Cultural value will change cross cultural influences. Organizations are emerging as cultural systems.
9. Change management:
10. Manager will face the challenge of managing change. They will need to aware specific changes and their likely impact on the practice of management.
11. Learning organization: Management needs to create learning environment. Organization of future will be predominantly knowledge based.

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LABORATORY SERVICES 2003 TO 2006
CURRENT STRATEGY AND FUTURE PROSPECTS

Bodhraj Acharya
Chief, Clinical Laboratory

Introduction

This report highlights the summary of laboratory activities through 2003-2006. The highlights have been described under below sub-headings.

- Background
- Reducing Error: building self- confidence
- Effective Communication: reduces public defamation
- Quality Management: Key to success
- Automation: to pace with time
- Automation through 2003 to 2006
- Turn Around Time (TAT): Sampling to reporting time
- Major Achievement 2003-2006
- Challenges
- Conclusion

Background

As 2007 gets underway, the clinical laboratory of SGNHC is buzzing with speculation about future directions in various arenas, the major of which are component separation, quantification of Troponins, BNP and pro-BNP, but are not limited to.

Looking back four years in SGNHC, we find a continuous struggle and breakthrough. The identity of our laboratory was something yet to be defined. I recall; few automated machines, limited QC measures, poor documentation and only we had in excess were complains. Service, Quality and Communication were the three major areas which were looking for a total reform. The restructuring process was not easy, really not straightforward. Today, we see its goals set and objective defined but the quest for continual changes has never satisfied our aspiration because we believe, advancement is a continuous process without an end.

Reducing Error: building self- confidence

Rooting out the cause of medical errors in the laboratory is a daunting, but crucial undertaking. The road that a specimen travels from its collection to analysis is filled with room for errors, which includes mislabeling, contamination, and even loss of the specimen. Laboratories which want to pursue an error-free environment should reorganize their labs according to workflow principles. In today's "outcome" oriented healthcare, we can't continue to ignore the bad outcomes or "defects" in our healthcare processes. A better process means higher efficiency, savings of time, money, and effort and better patient satisfaction. We have made a continuous effort to route the source of error which help to eliminate the repetition of the error type. Admitting instead of rejecting possible errors can make laboratory free from error.

Effective communication: reduces public defamation

The recent political and social changes in our country have made the public aware about the consumer rights. Improving health care quality is moving out of rhetoric and

into action. By providing accurate information about their health status, patients become empowered customers. Today, internet has made access to adequate information to the patients. Having access to more information, their demands increase or diversify. In response to this development, we should not lose sight of essential humane values. Effective communication means increasing satisfaction to their desire and reducing mess.

Quality Management: Key to success

Laboratory produces data which have no shape or size; they are not touched or felt; but they carry an important meaning within. This meaning is utilized in health processes, to diagnose, monitor or screen. So, producing a wrong data is altering the meaning, affecting the health management of an individual and inviting criticism. Therefore it should be stressed that; quality should not be a target it should be habit. West Guard Rules (WGR) to Biochemistry, and CUSUM analysis to hematology are some of the examples that have been applied in this years.

Internal Quality control Targets

Sub-unit	2003	2006	Target (2009)
Biochemistry	Monthly	Daily (IQC based decision for run)	IQC EQC and QA
Hematology	Yearly	Weekly	Daily Precision testing
Serology	Occasionally	Daily	Decision making level
Microbiology	Never	Yearly	Decision making level

Automation: to pace with time

Semi-automated instruments have been things of museum in the advanced laboratories of the world. Spectrophotometers are no more in existences. Automation has build momentum in every aspect of laboratory analysis, reducing turn around time (TAT) and increasing efficiency. Window based multi-functionality new analyzers provide opportunities for improving laboratory efficiency and communication. Shifting of routine mass analyses to fewer workstations and autoloader, using on-line communication with the laboratory information system, the workflow will be organized more efficiently. Integrated computer systems will assist laboratory professionals in the interpretation of increasingly complex test results.

But technology which commences with cost may distract the poorer from the test availability to their reach. Platelets by aphaeresis may cost 200 times higher than component separation. People's interest must be kept in the forefront before applying any technology.

Automation through 2003 to 2006

Sub-unit	2003	2006	Target (2009)
Biochemistry	Semi-Automation	Automation	TLA Platforms
Hematology	3-Part Differentiation Coulter	5-Part Differentiation Laser	Auto-loader, Auto-Stainer
Serology	------	ELISA Platforms	Automation EIA, Dedicated Serology

Turn Around Time (TAT): Sampling to reporting time

There is continuous discussion between physicians and laboratories regarding the TAT. Clinicians expect reduced TAT with precise outcome. Laboratories always look for accurate and precise outcome but flexible TAT. Excess reduction in TAT may sometimes reduce report quality, but extended TAT may effect patient management. We have set the meeting point somewhere in between.

Test	2003	2006	Target (2009)
PT	3 hours	1 ½ - 2 hours	1 hour
Emergency Testing	2 hours	1- 1 ½ hours	½ hours – 1 hour
Urgent testing panel (purposed)	------	------	15 – 30 minutes

Major Achievement 2003-2006

2003

Year 2003 was a year of struggle to get through. The need for change was felt, shared and brought to the interest of administrative authority. Vision and concept was set for the upgrade. We extended our service, started essential tests like Troponin, adopted some skilled technicians and set our goals. Physical extension was made from a single all-encompass laboratory to well defined sub-units. Blood banking guidelines and testing strategies were developed.

2004

Automation in biochemistry analysis was the major leap we made in the year. The random assay automated analyzer was adopted. Assays like Digoxin, Lipoprotein (a), Thyroid function tests and HbA_1C were started. Quality control linkage with National Public Health Laboratory (NPHL) was made. Bio-Safety and Infection control manuals, Standard Operating Procedure (SOP) for critical tests were developed

2005

Switch to ELISA testing from one step quick method of HIV HBsAg and HCV, ensured safe blood to the receiver and provide added safety to the medical practitioners. Sterility testing in critical areas initiated. Automation trainings provided opportunity to adopt latest advances. Exposure to international laboratory forums helped to understand and adopt the quality management in better way.

2006

Tests like ADA and Direct-HDL, Direct-LDL have been initiated and are in pace. Quantification of RA and ASO are looking for regular requisition. Cardiac specific tests like HsCRP have been started. Switch of Thyroid testing from tube to microwell EIA was made. Automation in biochemistry was more strengthened. Laser-based counting was started. Overall, quality became a part of testing procedure and decision making for run. Component separation is about to launch.

Challenges:

Although some advances have been made in the recent years there is a continuous challenge to keep hold of what we have gained. We must also keep our door opened for further improvements. Training human resources, retaining them, keeping the team work in chain and to always boost their morals is still a major challenge. If we

keep our commitment always lively we can always contribute to enhance the reputation of our patient friendly hospital through laboratory perspectives.

Conclusion:
The success credit goes to all the laboratory staff who worked with the spirit of team-work and to the management who was always supportive to the initiatives taken. We must make quality assurance the touchstone.