I WOULD NOW LIKE TO DISCUSS THE THEORY AND PRACTICE OF THE ART OF INTRANEURAL INJECTIONS SO THAT YOU WILL HAVE A BETTER UNDERSTANDING AS TO HOW AND WHY THESE TECHNIQUES ARE SO EFFECTIVE IN RELIEVING JOINT PAIN IN ANY TYPE OF THE ARTHRITIDES THAT YOU MAY TREAT IN YOUR PRACTICE. THESE TECHNIQUES CAN BE SUCCESSFULLY USED FOR PAINS OF OTHER TYPES IN THE BODY SUCH AS LOW BACK PAIN, SCIATICA, HEADACHES, AND OTHER PAIN SYNDROMES.

MOST PHYSICIANS ARE TAUGHT IN MEDICAL SCHOOL AND WITH GOOD REASON, THAT THE IDEA OF INTERFERING WITH THE PERIPHERAL NERVES CAN BE VERY DANGEROUS AND WE SHOULD LEAVE THE NERVES ALONE BECAUSE TO INTERFERE WITH THESE DELICATE STRUCTURES COULD CAUSE MUCH PAIN, DISTRESS AND EVEN PARALYSIS. THIS CONCEPT IS OF COURSE TRUE WITH SUCH PROCEDURES AS SURGERY, INJECTING SCLEROSING AGENTS OR BY USING COAGULATING DIATHERMY, BUT BY USING THE TECHNIQUES I WILL SHOW YOU TODAY, I WANT TO ASSURE YOU THAT THE TECHNIQUES ARE ABSOLUTELY SAFE AND HARMLESS. I’VE GIVEN LITERALLY THOUSANDS OF INJECTIONS AND I’VE NEVER SEEN OR FOR THAT MATTER, EVEN HEARD ABOUT ANY DETRIMENTAL EFFECTS ON THE INJECTED NERVES BY THESE TECHNIQUES. ANY PHYSICIAN WITH AVERAGE COMPETENCY, WITH A REASONABLE PROFICIENCY WITH A SYRINGE AND NEEDLE AND A FAIR KNOWLEDGE OF ANATOMY, ESPECIALLY THE SUPERFICIAL NERVES, CAN EASILY PERFORM ALL OF THE PROCEDURES IN HIS OFFICE. THESE TECHNIQUES ARE WELL WORTH LEARNING AND USING IN YOUR PRACTICE AND THE results WILL BE MOST GRATIFYING TO YOUR PATIENTS AS WELL AS TO YOURSELF.

IN THE LATTER PART OF THE LAST CENTURY AND THE BEGINNING OF THIS CENTURY, MEDICAL SCIENCE AT THAT TIME, ACCEPTED THE FACT THAT THERE WERE MICROSCOPIC SIZE NERVES THROUGHOUT THE BODY KNOWN AS TROPHIC NERVES, THAT CONNECTED ALL CELLS TO THE NERVOUS SYSTEM. THESE NERVES WERE ACCEPTED BY SCIENTISTS AS SERVING A PROTECTIVE ROLE FOR THE VARIOUS BODY TISSUES BUT THEY WERE NEVER SCIENTIFICALLY PROVEN AND REMAIN SO TODAY. THIS INABILITY TO PROVE THEIR EXISTENCE ANATOMICALLY WITH HISTOLOGICAL STUDIES FINALLY LED TO THEIR VERY EXISTENCE BEING CHALLENGED AND SINCE THAT TIME THEY HAVE BEEN LARGELY IGNORED. RECENT INTEREST HAS BEEN STIMULATED WITH THE EMERGENCE OF A RELATIVELY NEW FIELD OF MEDICINE CALLED PSYCHO-NEURO-IMMUNOLOGY WHERE MUCH EVIDENCE IS ACCUMULATING THAT THE BRAIN, PERIPHERAL NERVES AND THE IMMUNE SYSTEM IS ALL INTERRELATED. ORTHODOX MEDICINE I SUSPECT, NATURALLY WILL CONTINUE TO OPPOSE SUCH THINKING AS SHOWN BY MOST ADVANCEMENTS IN THE HISTORY OF MEDICINE.

ANYHOW, IN THE EARLY 1940’s, DR. WYBURN-MASON AND HIS STUDENT, DR. PAUL PYBUS, BECAME TOTALLY CONVINCED THAT THESE TINY MICROSCOPIC NERVES GOING TO THE BODY CELLS WERE INVOLVED IN CELL NUTRITION AND CONTROLLED THE BASIC FUNCTIONING OF ALL CELLS. IN FACT, DR. WYBURN-MASON PUBLISHED A 1,000 PAGE BOOK ENTITLED "TROPHIC NERVES" IN 1950 IN WHICH HE RESEARCHED THE LITERATURE CONCERNING THE ROLE OF THESE TROPHIC NERVES IN NORMAL AND PATHOLOGIC PHYSIOLOGY. THE GENIUS OF HIS WORK WAS NEVER RECOGNIZED AND THIS BOOK IS FASCINATING TO READ. MOST SCIENTISTS OF TODAY HAVE HAD TO RECOGNIZE THE EXISTENCE OF THESE NERVES BECAUSE IT IS SO OBVIOUS THAT CERTAIN CHEMICALS SUCH AS HISTAMINE AND VARIOUS PROSTAGLANDINS ARE RELEASED IN AREAS OF INFLAMMATION BY A NERVOUS INFLUENCE.

IN STUDYING THE PROCESSES INVOLVED IN INFLAMMATION, DR. WYBURN-MASON HAD TO CONSIDER NUMEROUS FACTORS THAT WERE INVOLVED AND WHEN ALL FACTORS WERE CONSIDERED TOGETHER, THIS GAVE HIM A VERY CLEAR PICTURE AS TO WHAT TAKES PLACE IN THE ENTIRE PROCESS OF INFLAMMATION.

HE KNEW THERE WERE 2 TYPES OF PAIN EXPERIENCED BY THE HUMAN BODY. THERE IS SUPERFICIAL OR EPICRITIC PAIN SUCH AS PRODUCED BY A PINPRICK OR BURN AND THIS IS CONDUCTED BY THE ALPHA TYPE NERVE FIBERS OR TYPE III BY THE AMERICAN CLASSIFICATION. THESE FIBERS ARE FAIRLY THICK, ABOUT 5 MICRONS IN DIAMETER AND CONDUCT PAIN AT A RATE OF 12 TO 30 METERS PER SECOND AND THEY ARE MYELINATED FIBERS WHICH ALLOW A SLOW ANESTHETIZATION RATE OF 4-6 MINUTES.

THEY PRIMARILY ORIGINATE IN THE SKIN RECEPTORS AND ARE FAIRLY SPARSE IN NUMBER AND THEIR CELL BODIES ARE LOCATED IN THE POSTERIOR OR DORSAL HORN OF THE SPINAL CORD AND BY INTERMEDIATE NERVE CELLS WHICH CARRY THE NERVE IMPULSE TO TWO PLACES - THE BRAIN AND REFLEXLY BY WAY OF THE ANTERIOR OR VENTRAL HORN CELLS TO THE MUSCLES IN THE REGION OF THE STIMULUS. THESE FIBERS PLAY NO PART AT ALL IN ARTHRITIC PAIN. THESE FIBERS BECOME FATIGUED VERY EASILY.

THE SECOND TYPE OF PAIN IS DEEP PAIN OR PROTOPATHIC PAIN AND IS THE TYPE OF PAIN SEEN IN INFLAMED TISSUES AS THE ARTHRITIC JOINT PAINS. THIS DEEP OR SLOW PAIN IS POORLY LOCALIZED AND IS CARRIED BY THE C-TYPE OR TYPE IV FIBERS AND THESE FIBERS ARE VERY THIN WITH A DIAMETER OF 0.5 TO 0.8 MICRON AND A VERY SLOW CONDUCTION RATE OF 1/2 TO 2 METERS AND THEY ARE UNMYELINATED WHICH PRODUCES A RAPID ANESTHESIATION RATE OF 2 SECONDS. THESE FIBERS ARISE FROM RECEPTORS IN THE DEEP AND SUPERFICIAL TISSUES AS THE SKIN AND INTERNAL ORGANS AND WHEN STIMULATED, THEIR AXONS CAN TRANSMIT NERVOUS IMPULSES IN BOTH PRODROMIC
OR IN THE NORMAL DIRECTION AND ANTIDROMIC OR THE OPPOSITE OF NORMAL DIRECTION. THESE C FIBERS ARE MUCH MORE NUMEROUS THAN THE A FIBERS AND THEY HAVE THEIR CELL BODIES IN THE GANGLIA OF THE DORSAL ROOTS AND THEY ARE VERY SLOWLY FATIGABLE. THESE C FIBERS ARE UBQUITOUS, RESPONSIBLE FOR REFLEX RESPONSES AND ARE THE ORIGIN OF ARTHRITIC PAINS AND ARE THE SAME AS THE NERVE FIBERS CALLED TROPHIC NERVES BY DR. WYBURN-MASON. THESE C FIBERS WHEN IRRITATED AT ANY POINT ALONG THEIR LENGTH CAN TRANSMIT ECTOPI C impulses in EITHER DIRECTION AND THE PRODROMIC OR NORMAL STIMULATION impulses PRODUCE THE DEEP SLOW PAIN SEEN IN ARTHRITIC JOINTS AS THE impulse IS CONDUCTED ALONG THE AXONS OF THE POSTERIOR OR DORSAL ROOT GANGLIA CELLS TO THE SPINAL CORD AND THEN TO THE BRAIN. SINCE THEY ARE ALSO RESPONSIBLE FOR REFLEX ACTION, THE impulses ARE RELAYED TO THE VENTRAL OR ANTERIOR HORN CELLS TO THE MUSCLE FIBERS IN THOSE MUSCLES ADJACENT TO THE ORIGINAL STIMULUS TO RESULT IN REFLEX MUSCULAR SPASM.

THE ANTIDROMIC impulses ARE RELAYED TO THE BLOOD VESSELS AND OTHER STRUCTURES IN THE REGION OF THE PERIPHERAL ORIGIN OF THESE NERVE FIBERS CAUSING A RELEASE OF A NERVE HORMONE KNOWN AS SUBSTANCE P AND THIS PEPTIDE CAUSES IMMEDIATE VASO-DILATION WHICH PRODUCES HEAT AND EDEMA AND SWELLING AT THE SITE OF THE ORIGINAL STIMULUS. THESE ARE THE EXACT CHANGES THAT ARE SEEN IN THE PROCESS OF INFLAMMATION AND THEY ARE ALSO SEEN WHEN THE DISTAL END OF A FRESHLY CUT OR SEVERED SENSORY NERVE IS STIMULATED AND THE PEPTIDE (A NEUROHORMONE) AND CERTAIN PROSTAGLANDINS ARE RELEASED AND INFLAMMATION CHANGES RESULT.

THEREFORE WITH INTACT, NORMALLY FUNCTIONING NERVES IN THE SKIN WHICH RECEIVE PAIN SENSATIONS, WHEN STIMULATED AS BY A BEE STING, AN INFLAMMATORY RESPONSE QUICKLY DEVELOPS WITH DILATED CAPILLARIES, EDEMA AND REDNESS DUE TO A FLARE OF ADDITIONAL ARTERY DILATION.

IN CONTRAST, BY SEVERING THE SENSORY NERVES GOING TO THESE AREAS, PRIOR TO STIMULATING THE SAME PAIN RECEPTORS, THE AREAS WILL DEVELOP PAINLESS TROPHIC ULCERS OR SORES WHICH REALLY ARE AREAS OF GANGRENE OF THE SKIN AND THIS IS NOT INFLAMMATION. THESE AREAS SHOW NO ATTEMPT AT HEALING OR REGENERATION. THEREFORE TO DEVELOP INFLAMMATION, AN INTACT SENSORY NERVE SUPPLY MUST BE PRESENT, OTHERWISE WHEN THE NERVE SUPPLY IS GONE, NO INFLAMMATION RESULTS AFTER STIMULATION BY A NOXIOUS SUBSTANCE APPLICATION. NO INFLAMMATORY REACTION IS SEEN BUT THERE DEVELOPS ANOTHER PAINLESS, NECROTIC, DECAYING ULCER WHICH MAKES NO ATTEMPT TO HEAL. TO SUPPORT THIS, THE LENS OF THE EYE IS THE ONLY ORGAN HAVING NO NERVE SUPPLY AND IT NEVER DEVELOPS INFLAMMATION AFTER INJURY BUT NECROSIS RESULTS.

ALSO, MALIGNANT TUMORS HAVE NO NERVE SUPPLY AND IRRITANT CHEMICALS APPLIED TO THEM CAUSED NO PAIN OR INFLAMMATION, BUT DID CAUSE NECROSIS. FINALLY, DR. WYBURN-MASON LEARNED THAT LOCAL ANESTHETICS SUCH AS COCAINE OR PROCAINE WHICH DEPRESS NERVOUS ACTIVITY IN NERVE FIBERS ARE ANTI-INFLAMMATORY AND RELIEVE PAIN WHEN APPLIED TO THE NERVES. THIS DEMONSTRATED THAT SUPPRESSION OF NERVOUS ACTIVITY BY LOCAL ANESTHETICS INHIBITS THE INFLAMMATORY PROCESS.

ALL THESE STUDIES PROVED THAT THE INFLAMMATORY RESPONSE TO INJURY, DRUGS OR LOCAL INFECTION AND THE HEALING RESPONSE, DEPEND ON AN INTACT EFFERANT POSTERIOR NERVE ROOT SUPPLY AND IS PRIMARILY REFLEXLY NEUROGENICALLY PRODUCED WITH THE LIBERATION OF A NERVE HORMONE, THE SP SUBSTANCE, AT THE PERIPHERAL NERVE ENDINGS AS WELL AS CERTAIN INFLAMMATORY PROSTAGLANDINS AS LEUKOTRIENES. INFLAMMATION DOES NOT OCCUR IN RESPONSE TO INJURY IN A COMPLETELY NERVELESS AREA OR ORGAN BUT ONLY GANGRENE AND A FAILURE TO HEAL. THEREFORE, FROM THE RESEARCH OF DR. WYBURN-MASON ALONG WITH OTHER STUDIES, I HAVEN'T HAD TIME TO GO INTO DETAIL ABOUT, WE CAN CORRECTLY CONCLUDE THAT NERVOUS ACTIVITY IS THE PRIME CAUSE OF INFLAMMATION. THIS INFLAMMATION IS CAUSED BY ANTIDROMIC impulses TRAVELING ALONG THE DAMAGED UNMYELINATED NERVE FIBERS TO THE NERVE TARGET AREA OR IN THE CASE OF ARTHRITIS, TO THE PERIPHERY IN THE JOINT CAUSING PAIN, SWELLING AND REDNESS.

I PERSONALLY BELIEVE THAT CALLING THESE NERVES "TROPHIC NERVES" CAN CAUSE SOME CONFUSION AND I PREFER TO SIMPLY REFER TO THEM AS THE C-TYPE DORSAL ROOT FIBERS OR TYPE IV AS THEY ARE CALLED IN THE NUMERICAL CLASSIFICATION.

MANY PHYSICIANS AND CLINICIANS HAVE OBSERVED THAT THESE NERVES WHEN AFFECTED OR INFLAMED ARE VERY PAINFUL AND TENDER TO THE TOUCH AND THE ACTUAL CAUSE OF TENDERNESS HAS NOT BEEN DETERMINED, BUT IT HAS BEEN POSTULATED THAT NUTRITIONAL AND/OR ELECTRICAL POTENTIAL IMBALANCES OR TRAUMA TO THE NERVES MAY BE RESPONSIBLE. THE POSSIBILITY OF INVASION OF THE NERVES THEMSELVES BY PATHOGENIC GERMS, HAS NOT BEEN RULED OUT. TO UNDERSTAND THIS THEORY MORE CLEARLY IN OUR DISCUSSION, IT IS IMPORTANT TO HAVE A MODEL TO REFER TO AND TO SIMPLIFY MATTERS. I AM GOING TO USE THE KNEE JOINT AS THE ANATOMICAL MODEL AND USE OSTEOARTHRITIS AS THE DISEASE MODEL. MANY OF THE UNMYELINATED C FIBERS TRAVEL TO THE KNEE IN THE SAPHENOUS NERVE AND IT'S INFRAFATELLAR BRANCHES. THERE IS ALSO EVIDENCE THAT THE WEAKEST PART OF THE KNEE JOINT IS THE MEDIAL LONGITUDINAL LIGAMENT (OR TIBIAL...
COLLATERAL LIGAMENT), THE SAPHENOUS NERVE LIES ON THE SURFACE OF THIS LIGAMENT WHERE IT IS READILY EXPOSED TO TRAUMA, PARTIAL RUPTURE AND THUS CAUSALGIA WITH THE PASSAGE OF BOTH PRODROMIC IMPULSES WHICH PRODUCE PAIN AND MUSCLE SPASM AND ANTIDROMIC IMPULSES LEADING TO INCREASED VASCULARITY AND EDEMA IN THE JOINT AND SURROUNDING TISSUES. DR. WYBURN-MASON SHOWN THAT IN CASES OF CAUSALGIA DUE TO NERVE INJURY, HYPERTROPHIC DISTURBANCES OCCUR IN THE TISSUES DISTAL TO THE NERVE INJURY AND THESE INCLUDE JOINT CHANGES. OSTEOARTHRITIS OF THE KNEE MAY ALSO RESULT FROM TRAUMA TO THIS SAPHENOUS NERVE AND THE PAIN OF CAUSALGIA AS WELL AS THE PAIN IN OSTEOARTHRITIS CAN BE RELIEVED BY INJECTING NOVACAINE AT THE POINT OF NERVE INJURY. OSTEOARTHRITIS, OSTEOARTHRITIS OR DEGENERATIVE JOINT DISEASE IS A PAINFUL DEGENERATIVE CONDITION AFFECTING MAINLY THE LARGER, WEIGHT-BEARING JOINTS AND RESULTS IN EROSION OF THE CARTILAGE (OSTEOARTHRITIS) AND INFLAMMATION OF THE SYNOVIA (OSTEOARTHRITIS). AS YOU ALL KNOW, IT IS OFTEN SEEN FOLLOWING A KNEE INJURY OR A SERIES OF MINOR INJURIES OVER A LONGER PERIOD OF TIME. TYPICALLY A PATIENT COMPLAINS OF A STIFF JOINT EACH MORNING ON AWAKENING AND OFTEN THE JOINT IS PAINFUL. USUALLY THE STIFFNESS GOES AWAY OR LESSENS DURING THE DAY, BUT BY LATE AFTERNOON AND EVENING, THE PAIN BECOMES MORE SEVERE. THE JOINT MOVEMENTS ARE OFTEN ACCOMPANIED BY CREPITIS OR CREAKING. THE PAIN IS USUALLY RELIEVED BY REST, WARMER CLIMATES AND PRESSURE BANDAGING, BUT IS MADE WORSE BY EXERCISE, COLD AND WET CONDITIONS AND FURTHER INJURY.


OTHER RESEARCHERS, DR. R.A. COLANDRUCCIO AND W.SCOTT GILMER, FURTHER SHOWED THAT IF THIS FIXATION COMPRESSION WAS RELEASED BEFORE THE FINAL DESTRUCTIVE STAGES, THE PROCESS WAS REVERSIBLE AND THEY FELT THE CAUSE WAS IMPAIRED NUTRITION TO THE CARTILAGE CELLS. THIS MEANS WE CAN REVERSE DAMAGE IN OSTEOARTHRITIS IF DIAGNOSED CORRECTLY AND TREATMENT IS INSTITUTED EARLY ENOUGH. ORTHOPEDIC SURGEONS HAVE SEEN A SIMILAR CONDITION IN MAN AND HAVE OFTEN NOTED THAT WHEN CONTINUAL SUSTAINED PRESSURE IS APPLIED TO JOINTS DURING THE COURSE OF FRACTURE TREATMENTS, OSTEOARTHRITIS CAN RESULT. A GOOD EXAMPLE IS THE "WELL LEG" TRACTION TREATMENT FOR INTERROCHANTERIC FRACTURE OF THE NECK OF THE FEMUR WHICH OFTEN RESULTS IN OSTEOARTHRITIS DEVELOPING IN THE KNEE OF THE UNFRACTURED SIDE, DUE TO PRESSURE ON THAT KNEE EXERTED BY THE APPARATUS.

IT IS OBVIOUS FROM MY CLINICAL OBSERVATIONS OF PATIENTS WITH OSTEOARTHRITIS, THAT JOINT PAIN AND STIFFNESS LEADS TO AT LEAST PARTIAL JOINT FIXATION. CHRONIC MUSCLE SPASM OF THE MUSCLES SURROUNDING THE JOINT ALSO CONTRIBUTES TO THE CONTINUING BUT INTERMITTENT COMPRESSION. THIS IS MADE WORSE IF THE PATIENT IS OBESE. IT IS PROBABLE THEREFORE THAT CHRONIC PARTIAL JOINT FIXATION AND COMPRESSION LEAD SECONDARILY TO DEGENERATION OF THE
CARTILAGE. WITH THIS REASONING, BY RELIEVING THE PAIN AND SPASM OF THE JOINT, THE DEGENERATIVE CHANGES PERHAPS MAY BE ARRESTED AND POSSIBLY EVEN REVERSED.

LET ME GO INTO A LITTLE MORE DETAIL ON THE ORIGIN OF PAIN AND SPASM WITH THIS NEXT SLIDE.

1. THIS IS A NERVE CELL OF A MOTOR NERVE.
2. THIS SLIDE SHOWS THE NORMAL REFLEX ARC.
3. HERE'S ANOTHER SLIDE SHOWING A NORMAL REFLEX ARC.
4. THIS SLIDE DEPICTS WHAT HAPPENS WHEN THE SENSORY NERVE IS DAMAGED OR INJURED.

IT HAS BEEN PROVEN OVER THE YEARS THAT DEFINITE ELECTRICAL IMPULSES FLOW ALONG NERVES DURING THE PASSAGE OF AN IMPULSE. THE INTERIOR PART OF THE AXON IS NEGATIVELY CHARGED AND THIS CAN BE MEASURED WITH A GALVANOMETER.

IT IS WELL KNOWN AND IS DESCRIBED IN MOST PHYSIOLOGY TEXT BOOKS THAT IN A NORMAL RESTING NERVE, THERE IS A DEFINITE ELECTRICAL POTENTIAL DIFFERENCE OF 70 MILLIVOLTS BETWEEN THE INSIDE SEMI-FLUID CONTENTS WHICH IS NEGATIVELY CHARGED AND THE OUTSIDE OF THE NERVE WHICH IS POSITIVELY CHARGED.

AT THE TERMINAL END OF A TROPHIC NERVE (C-TYPE UNMYELINATED FIBRE) IS A PLAIN NERVE ENDING OR TERMINAL BUTTON, AND THESE TERMINAL BUTTONS ARE SENSITIVE TO EXTERNAL STIMULI INITIATING A DESTABILISATION OF THE NEURILEMMA IN WHICH THE NERVE FIBRE IS ENCLOSED. THIS DESTABILISATION RESULTS IN THE ESCAPE OF ELECTRONS OR NEGATIVELY CHARGED PARTICLES THROUGH THE NERVE MEMBRANE TO NEUTRALISE THE POSITIVELY CHARGED OUTER SURFACE. THIS CAUSES FURTHER DESTABILISATION ALONG THE NERVE RESULTING IN AN ON-GOING LEAK OF ELECTRONS, SO THAT THE IMPULSE IS PROPAGATED IN THIS FASHION.

NORMALLY IMPULSES ARE ONLY CONDUCTED ALONG THE NERVE IN THIS PROGRADE FASHION, AS THE MEMBRANE IS RAPIDLY RESTITUTED AFTER THE PASSAGE OF THE IMPULSE AND IS RESTORED TO IT'S RESTING STATE, WHEN IT IS AGAIN READY TO RECEIVE ANOTHER IMPULSE. THE TIME BETWEEN THE PASSAGE OF THE IMPULSE AND RESTORATION TO NORMALITY IS IN THE REGION OF 2 MILLISECONDS AND IS KNOWN AS THE LATENT PERIOD. THIS PERIOD IS DIVIDED INTO AN ABSOLUTE REFRACTORY PERIOD, DURING WHICH TIME NO STIMULUS, HOWEVER STRONG, WILL PRODUCE AN IMPULSE AND A RELATIVE REFRACTORY PERIOD DURING WHICH A STRONGER-THAN NORMAL STIMULUS WILL PRODUCE AN IMPULSE. IN THIS WAY, IF THE IMPULSES ARE STRONG ENOUGH, IT IS POSSIBLE TO PRODUCE A BARRAGE OF IMPULSES WHICH SUMMATE ONE WITH ANOTHER TO PRODUCE A TETANUS.

NORMALLY THE AXON MEMBRANE IS IMPERVIOUS TO ELECTRONS SO NO CURRENT FLOWS. WITH A NORMAL IMPULSE, IT USUALLY ORIGINATES IN A SENSORY RECEPTOR OR TERMINAL BUTTON AT THE END OF THE AXON AS IN THE SKIN AND THE IMPULSE USUALLY FLOWS ONLY IN ONE DIRECTION AS TOWARDS THE SPINAL COLUMN.

WITH DAMAGE TO A NERVE FIBER THERE IS AN ELECTRICAL DISTURBANCE WHEREBY ELECTRONS LEAK THROUGH THE MEMBRANE AND CAUSE A NEGATIVELY CHARGED AREA TO BUILD UP AROUND THE DAMAGE. THIS BUILDUP OF NEGATIVE CHARGES ACTS AS A GENERATOR OF ELECTRICAL STIMULI TO TRAVEL ALONG THE POSITIVELY CHARGED SHEATH IN BOTH DIRECTIONS. THIS CAUSES EXTREME DISCOMFORT BUT DOES NOT AFFECT THE JOINT IN ANY WAY. IN THE DORSAL ROOT GANGLIA THE SAME IMPULSE TRAVELS BY WAY OF INTERMEDIARY NEURONS TO THE VENTRAL HORN CELLS WHICH DISCHARGE TO GIVE A TETANIC BARRAGE OF IMPULSES TO THE LOCAL MUSCULATURE WHICH PRODUCES A MUSCULAR SPASM OR STIFFNESS THAT THESE PATIENTS NOTICE IN THE JOINTS EACH MORNING. THIS PRODROMIC IMPULSES ARE RELAYED CENTRALLY BY WAY OF THE DORSAL HORN OF THE SPINAL COLUMN TO THE SPINOThALAMIC TRACT TO REACH THE THALAMUS WHERE THEY ARE INTERPRETED AS PAIN. NOW, THE ANTIDROMIC IMPULSES ARE CONDUCTED PERIPHERALLY TO THE REGION OF THE SENSORY NERVE ENDING WHERE SUMMATED IMPULSES TO THE BLOOD VESSELS RESULTS IN INTENSE DILATION, LOCAL INCREASE IN TEMPERATURE, REDNESS, EDEMA AND EVEN SYNOVIAL EFFUSION WHICH ARE THE LOCAL TISSUE CHANGES THAT OCCUR ARE DUE TO THE RELEASE BY THE NERVE ENDOGENOUS SUBSTANCE AND THE MOST INFLAMMATORY CAUSING PROSTAGLANDIN KNOWN AS LEUKOTRIENES. THE LEUKOTRIENES ARE MANUFACTURED FROM A FATTY ACID CALLED ARACHIDONIC ACID WHICH IS FOUND IN HIGH AMOUNTS IN FOODS SUCH AS RED MEATS, SHELLFISH AND CERTAIN DAIRY PRODUCTS. MOST ALL OF THE NON-STERIOD ANTI-INFLAMMATORY DRUGS (NSAIDS) SUCH AS MOTRIN, CLINORIL, Feldene, Orudis, ETC. AS WELL AS ASPIRIN, PRODUCE THEIR ANTI-INFLAMMATORY EFFECT PRIMARILY BY BLOCKING THE CONVERSION OF ARACHIDONIC ACID TO THE
LEUKOTRIENES BUT IT IS NOT PROVEN AS YET TO MY KNOWLEDGE THAT THE PRODUCTION OF THE SP SUBSTANCE IS STOPPED. IF THE SP SUBSTANCE IS NOT BLOCKED, THIS MAY ACCOUNT FOR THE FACT THAT QUITE OFTEN VARIOUS NSAIDS DO NOT RELIEVE THE PAIN AND INFLAMMATORY CHANGES SEEN IN PATIENTS BEING TREATED WITH THESE DRUGS. I HAVE PREVIOUSLY SHOWN HOW TWO FATTY ACIDS, GAMMA LINOLENIC ACID OR GLA WHICH MAKES PROSTAGLANDINS E-1 AND EICOSAPENTANOIC ACID OR EPA BOTH ALSO BLOCK THE PRODUCTION OF THE LEUKOTRIENES AND THIS IS THE MAIN REASON I ALWAYS SUPPLEMENT MY ARTHRITIC PATIENTS BEING TREATED WITH GLA AND EPA OILS WHICH I BELIEVE ARE BETTER THAN NSAIDS BECAUSE THEY DO NOT BLOCK THE PRODUCTION OF A VERY BENEFICIAL PROSTAGLANDIN CALLED PROSTACYCLIN. I DO NOT HOWEVER, BELIEVE THAT THE GLA AND EPA BLOCK THE PRODUCTION OF THE SP SUBSTANCE BUT THE INTRANEURAL INJECTIONS DO PLAY A PART IN DECREASING ITS PRODUCTION.

TO SUM UP THE ENTIRE PROCESS, WE SEE THEN 6 ACTUAL CONDITIONS TAKING PLACE:
1. A DESTABILIZED NERVE MEMBRANE DUE TO TRAUMA WITH AN ELECTRICAL DISTURBANCE.
2. A DISTAL INFLAMMATION DUE TO ANTI-DROMIC IMPULSES TO LOCAL BLOOD VESSELS.
3. REFERRED PAIN IN THE JOINT FROM PRODROMIC IMPULSES ARISING FROM THE NERVE AND NOT THE JOINT.
4. REFLEX SPASM IN THE JOINT MUSCLES CAUSING STIFFNESS.
5. COMPRESSION OF THE ARTICULAR CARTILAGE RESULTING IN FAULTY CARTILAGE NUTRITION.
6. CARTILAGE DETERIORATION AND FULL BLOWN OSTEOARTHRITIS.

TO CORRECT THIS PROBLEM, ONE OF THREE THINGS MUST BE DONE. EITHER THIS EXCESS ACCUMULATION OF NEGATIVE ELECTRONS MUST BE REMOVED OR THE LEAK OF ELECTRONS FROM THE SHEATH MUST BE STOPPED AND BOTH OF THESE EVENTS MUST BE PERMANENT TO BE EFFECTIVE. THE EXCESS NEGATIVE ELECTRONS CAN BE REMOVED PHYSICALLY BY INSERTING AN ACUPUNCTURE NEEDLE WHICH DRAWS THE NEGATIVE ELECTRONS TO THE SHARP POINT OF THE NEEDLE THROUGH THE OPERATOR OR PHYSICIAN LIKE A LIGHTENING ROD, AND ON TO THE GROUND AND IT HAS BEEN OBSERVED THAT BAREFOOT PRACTITIONERS GET BETTER RESULTS THAN THOSE PRACTITIONERS WEARING SHOES. THIS PROCEDURE DOES NOT HEAL THE DEFECT CAUSING THE LEAKING OF ELECTRONS HOWEVER, BUT IT DOES OFFER TEMPORARY RELIEF.

ANOTHER METHOD OF CORRECTING THE PROBLEM IS BY BLOCKING AND REPAIRING THE MINUTE AREA OF INFLAMMATION IN THE NERVE WITH A MEMBRANE STABILIZER SUCH AS PROCaine OR XYLOCAINE OR EVEN COCAINE. ALL LOCAL ANESTHETICS ARE WELL KNOWN NERVE STABILIZERS AND THEIR ACTIONS ARE DESCRIBED IN MOST TEXTBOOKS ON ANESTHESIA. BUT WE ALL KNOW THAT ALL NERVE IMPULSES ARE TOTALLY BLOCKED BY LOCAL ANESTHETICS, EVEN THOUGH THE EFFECT IS ONLY TEMPORARY. WITH THE C TYPE FIBERS WE ARE DISCUSSING, THE BLOCKAGE OF IMPULSES TAKES ONLY 2 SECONDS BECAUSE THESE NERVES HAVE NO MYELIN SHEATH SO THE IMPULSES OF PAIN ARE TOTALLY BLOCKED VERY QUICKLY. AS ALREADY MENTIONED, WE ALL ALSO KNOW THAT THE ANESTHESIA AND PAIN RELIEF IS NOT PERMANENT BUT REMAINS ONLY AS LONG AS THE LOCAL ANESTHETIC AGENT IS PRESENT IN RELATION TO THE NERVE BEING BLOCKED.

TO BE TOTALLY SUCCESSFUL IN OUR TREATMENT OF THESE DAMAGED NERVES FOR ARTHRITIS, WE MUST FIND A MEANS OF PERMANENTLY STABILIZING THE DAMAGED NERVES AND REMOVING THE INFLAMMATION AT THE SITE OF INJURY. ONE OF THE BEST ANTI-INFLAMMATORY AGENTS IS CORTISONE BUT ITS SYSTEMIC EFFECTS MAKE IT IMPractical AND DANGEROUS. IDEALLY WE NEED AN ANTI-INFLAMMATORY MEDICATION THAT COULD BE DEPOSITED AT THE INJURY SITE OF THE NERVE AND REMAIN IN PLACE TO PERMANENTLY HEAL THE INFLAMMATION. DEPO STEROID PREPARATIONS ARE PRESENTLY THE BEST SOLUTION TO THIS PROBLEM AND THERE ARE 3 SUCH PRODUCTS AVAILABLE.

1. METHYL PREDNISOLONE ACETATE OR DEPO MEDROL HAS A DEPO OR DEPOSITED EFFECT BUT IT'S DISADVANTAGE IS THAT IT TAKES 6-8 HOURS FOR IT'S ANTI INFLAMMATORY ACTION TO TAKE PLACE. SO BY USING THIS DEPO MEDROL WITH THE LOCAL ANESTHETIC, WE SEE A 2 TO 3 HOUR TIME LAG BETWEEN THE ACTION OF THE LOCAL ANESTHETIC AND THE STEROID AND THE PAIN MAY REOCCUR TO0 SOON WHICH MAY CAUSE ONLY A PARTIAL HEALING EFFECT.

2. ANOTHER DEPO STEROID IS BETA METHASONE ACETATE AND IS KNOWN AS CELESTONESOLUSPAN. THIS IS EFFECTIVE IN 2 TO 3 HOURS BUT THE COMMERCIAL PREPARATION HAS THE DISODIUM PHOSPHATE SALT ALSO INCLUDED WHICH IS RAPIDILY ABSORBED INTO THE SYSTEMIC CIRCULATION WHICH WOULD MORE EASILY CAUSE CORTISONE EFFECTS.

3. THE BEST PREPARATION I HAVE FOUND IS TRIAMCINOLONE HEXACETONIDE OR ARISTOSPAN AND IT HAS THE ADVANTAGE OF SLOW ABSORBABILITY AND VERY RAPID ACTION IN RELIEVING VERY EFFECTIVELY THE INFLAMMATION IN 3 TO 4 HOURS. THIS PREPARATION IS IDEAL AND ONLY A VERY SMALL AMOUNT IS NECESSARY AT EACH INJECTION SITE AND IN USING THIS PREPARATION IN MANY THOUSANDS OF INJECTIONS, I HAVE NOT OBSERVED ANY SERIOUS SYSTEMIC EFFECTS. WHEN I FIRST BEGAN USING THE ARISTOSPAN ABOUT 5 YEARS AGO, I USED ABOUT 3 TIMES MORE OF THE PRODUCT THEN THAN I USE NOW, AND IN A FEW INSTANCES, I WOULD NOTICE A SHRINKAGE OF THE SUBCUTANEOUS TISSUES AND A WHITISH DISCOLORATION OF THE SKIN AT INJECTION SITES WHERE THE SKIN WAS VERY THIN AS ON THE WRIST AND ABOVE THE ANKLES. FOR THIS REASON, IF I INJECT THESE
AREAS, I INJECT THEM LAST SO THE INJECTION SOLUTION WILL BE EVEN WEAKER OR DILUTED OUT AS THE ARISTOSPAN DOES HAVE A TENDENCY TO SETTLE OUT WHILE STANDING OR EVEN WHEN GIVING THE INJECTIONS.

IDEALLY A NON-STEROID ANTI-INFLAMMATORY PREPARATION WOULD BE BEST, BUT THERE ARE NONE PRESENTLY AVAILABLE THAT I KNOW OF THAT COULD BE INJECTED INTO THESE AREAS.

[Editors Note: Three doctors have since independently determined that the depo medrol is not necessary. These are Gus Prosch, Jr., M.D., Dr. Curt Maxwell, and Keith McElroy, M.D.]

NOW CONCERNING THE ACTUAL TECHNIQUE FOR THE INTRANEURAL INJECTIONS, I SHOULD MENTION THAT THE TREATMENT OF ALL ARTHRITIC JOINTS IS EXACTLY THE SAME. I WILL LATER DEMONSTRATE WITH SLIDES AND HANDOUTS THE EXACT SITES OF THE NERVES THAT ARE MOST COMMONLY AFFECTED, BUT I WOULD ALSO RECOMMEND THAT ANY PHYSICIAN USING THESE TECHNIQUES SPEND A LITTLE TIME IN REVIEWING THE ANATOMY OF THE NERVES AROUND THE VARIOUS JOINTS. THE LATEST OBSTACLE THAT PREVENTS MOST PHYSICIANS FROM USING THESE TECHNIQUES IN THEIR PRACTICES IS THE FEAR OF INJECTING INTO AN AREA THAT MIGHT CAUSE A PROBLEM OR SOME DAMAGE. THIS IS BECAUSE THEY LACK CONFIDENCE IN REMEMBERING THE ANATOMY THAT THEY STUDIED IN MEDICAL SCHOOL AND A BRIEF REVIEW OF ANATOMY WILL DO WONDERS TO RESTORE THE CONFIDENCE NEEDED. LET ME ALSO SAY THAT I HAVE IN THE PAST 5 YEARS, GIVEN OVER 50,000 OF THESE INJECTIONS AND I HAVE YET TO SEE ANY ILL EFFECTS OR PROBLEMS RESULTING FROM THE USE OF INTRANEURAL INJECTIONS. I HAVE PATIENTS WHO COME TO MY OFFICE FOR INTRANEURAL INJECTIONS FROM ALL OVER THE UNITED STATES AS WELL AS FROM SEVERAL FOREIGN COUNTRIES.

NOW ALL THE VARIOUS JOINTS HAVE DEFINITE POINTS WHERE THE NERVES SUPPLYING THESE JOINTS HAVE INFLAMED AREAS IF THE NERVES HAVE BEEN DAMAGED OR INJURED, OR ARE INFLAMED. THESE NERVES, IF INFLAMED, HAVE THE SAME PROPERTIES OF A NEUROMA IN THAT THEY ARE VERY TENDER TO THE TOUCH. THEY ARE ALL IN THE ANATOMICAL LINE OF A KNOWN NERVE. THEY ARE PAINFUL ON DISTORTION AND THE TENDER AREAS ARE RAPIDLY ELIMINATED BY INSERTION AND GROUNDING BY AN ACUPUNCTURE NEEDLE, THE LOCAL APPLICATION OF VARIOUS PHYSICAL AGENTS SUCH AS COLD, HEAT, MASSAGE, ULTRA SOUND, ETC. THEY CAN BE PERMANENTLY ELIMINATED BY INJECTING A LOCAL ANESTHETIC WITH A SMALL AMOUNT OF ARISTOSPAN INTO THE INFLAMED NERVE ITSELF.

IN THE PHYSICAL EXAMINATION, THE AFFECTED JOINTS SHOULD FIRST BE ASSESSED CLINICALLY BY PHYSICALLY EXAMINING THE JOINT AND NOTING IT'S SHAPE, COLOR, SWELLING, TEMPERATURE AND DEGREE OF PAIN AND FUNCTION. THE AMOUNT OF MUSCLE SPASM IS NOTED AND ALSO THE PRESENCE OF ANY CREPITANCE WITH MOTION. THE COURSE OF THE NERVES TO THE JOINTS IS THEN PRESSED EVERY 1½ TO 2 CENTIMETERS BY DEEP PRESSURE OF THE PHYSICIAN'S INDEX FINGERS, OR THE ERASER END OF AN ORDINARY PENCIL CAN BE USED TO PRESS DOWN OVER THE COURSE OF THE NERVE. THE PHYSICIAN SHOULD KEEP AN EYE ON THE PATIENT'S FACE AND AS SOON AS ANY TENDER POINT IS REACHED, THE PATIENT WILL WINCE BY SQUINTING THE EYES, JERKING AWAY, OR TELLING THE PHYSICIAN THAT THE PRESSURE HURTS. A SMALL X IS PLACED OVER EACH TENDER AREA WITH A SKIN PENCIL. WHEN THE EXAMINATION IS COMPLETED, MY NURSE DEADENS THE MARKED X'S WITH A MADAJET GUN WHILE I PREPARE THE SOLUTIONS TO INJECT. AN INTRA-DERMAL BLEB USING ANY LOCAL ANESTHETIC COULD BE USED AT EACH SITE, BUT THIS IS MORE PAINFUL. THE MADAJET IS FAST, SAFE AND LESS PAINFUL FOR THE PATIENT AND THE MADAJET IS AVAILABLE FROM TWO SOURCES - ONE IN THE UNITED STATES. THEY ARE AVAILABLE FROM MADA MEDICAL PRODUCTS, INC., 60 COMMERCE ROAD, CARLSTADT, N.J., 07072 AND THEY SELL FOR ABOUT $450.00. I HAVE BEEN TOLD THAT THEY CAN ALSO BE PURCHASED FROM ENGLAND FOR LESS THAN $200.00 BUT I HAVEN'T CHECKED IT OUT. THAT SUPPLIER IS PAN JET INJECTOR, INTERNATIONAL LONDON, LTD., LYNDHURST AVENUE, WOODLAWN ROAD, LONDON, N12 ONE, ENGLAND.

AFTER MARKING THE TENDER AREAS, I THEN COUNT THE TOTAL NUMBER OF INJECTIONS NEEDED AND IDEALLY WOULD LIKE TO USE A TOTAL OF 4 C.C. OF 1½% PROCAINE OR XYLOCAINE INTO EACH INJECTION SITE. IF I HAVE AS MANY AS 16 INJECTION SITES, I HAVE USED AS LITTLE AS 2½ C.C. TOTAL SOLUTION INTO EACH POINT, BUT I TAKE EXTRA PRECAUTIONS TO MAKE SURE I AM EXACTLY INTO THE NERVE AT THE PROPER SITE IF I USE ONLY THE 2½ C.C. AMOUNTS. I DO NOT WANT TO GIVE OVER 25 C.C. OF 2% PROCAINE OR XYLOCAINE AT ANY ONE INJECTION SESSION. WITH A TOTAL OF 10 TO 16 INJECTIONS, I USE A 35 C.C. SYRINGE WHICH WILL HOLD NEARLY 40 C.C. OF SOLUTION WHEN TOTALLY FULL. I PLACE ONE 2 C.C. OF THE ARISTOSPAN INTO THE SYRINGE, THEN FILL THE SYRINGE TO THE 25 C.C. LEVEL WITH A 2% PROCAINE, THEN DILUTE TO 40 C.C. WITH STERILE SALINE.

IF I NEED TO INJECT 10 AREAS OR TENDER SITES, I LOCATE THE NERVE AND INJECT 4 C.C. INTO EACH SITE. WITH A FULL SYRINGE OF 39-40 C.C. I CAN INJECT 3 C.C. TOTAL SOLUTION INTO UP TO 13 TENDER SITES. I PREFER NOT TO USE MORE THAN 23-24 C.C. OF THE 2 PROCAINE OR LIDOCAINE AT ANY ONE TIME AS THIS AMOUNT REMAINS BELOW THE TOXIC LEVEL BUT EVEN THIS AMOUNT WILL OFTEN MAKE THE PATIENT DIZZY, SWIMMY HEADED OR FEEL 'DRUNK' BUT ONLY RARELY
causes nausea or headaches. TO give more than this recommended amount of the anesthetic will cause nausea and vomiting and severe headaches. These side effects of dizziness and feeling drunk will usually disappear after 20-30 minutes or so. After completing the injections I usually have the patient lie down on the examining table for 30 minutes before allowing them to get dressed and leave the office.

For 4 to 6 injection points, I use a 20 C.C. syringe and place 3/4 to 1 C.C. Aristospan in the syringe and use 2/3 Procaine or Lidocaine 2% and 1/3 saline to make a 1½% Procaine solution. Therefore with this size syringe which I can usually "pack" the total amount to make 24 C.C. I normally end up using 15 C.C. of the 2% anesthetic solution, and this allows me to inject 3-4 C.C. of the final solution into 4 to 8 injection sites.

For 3 injections, I use a 12 C.C. syringe and for 1 injection I use a 5 C.C. syringe. As already mentioned, I prefer 4 C.C. of 1½% Procaine or Lidocaine into each injection site and usually place about 0.4 to 0.5 C.C. Aristospan for every 10 C.C. of total injectable solution. Occasionally I see patients with many joints that have arthritis and need to inject much more than the 13 total injection sites (of 3 C.C. each). With these patients I give the 13 injections and have the patient return the following day to complete the injections, or I will allow the patient to lie down for two hours after completing the first injections and then finish up the remaining injections after that time.

When the injectable solutions are prepared, I usually use a 22 gauge 1½ inch needle and enter the skin at the intradermal bleb my nurse has already anaesthetised and aim the needle in the direction of the nerve. The nerves usually lie just on top of the muscles and under the sub cutaneous tissues. As I watch the patient’s face and had previously told the patient to tell me when a sharp sting is felt, I go in and out down to the muscle tissue in a plane perpendicular to the direction of the nerve and the patient will wince their eyes or tell me when the nerve is hit. At this point, I inject the 3 or 4 C.C. of prepared solution into the nerve. I usually make 3-4 extra jabs around the nerve and inject a small amount of the solution in those areas to make sure I cover the entire nerve area. I should mention here that occasionally the nerve you will try to locate is very small and difficult to find. After practicing this technique several times you will begin to notice that you will begin to develop a 'feel' for certain tissues as you touch them with the inserted needle. You should very lightly allow the needle to penetrate the tissues down to the muscle layer where a more resistant 'feel' will be noticed. The nerves are usually found right on top of the muscle layers and you should not 'push' the needle strongly through the tissue layers as you will lose the sensitivity of the needle if too much pressure is exerted. I often just allow the weight of the syringe to be the main pushing force. If I have made an adequate attempt to locate the nerve and am still not exactly sure, I may at that time, just 'spread out' the solution in the area where the tenderness is located and this will insure that even if I am unable to 'hit' the nerve, the injected solution will most likely cover the nerve I was trying to locate. A bandaid is applied and I move on to the next nerve point to be injected.

I normally use the 22 gauge 1½ inch needle for most injection sites except for the wrist and ankle areas. Here I use a 23 gauge, 1 inch needle, for the hip joint area I use a 22 gauge, 3 inch needle and if the patient is obese, I use this 3 inch needle to inject the superior clunial nerves. After each joint is completed, the pain is gone if all tender nerves have been injected properly and the muscle spasm is also gone. The joint is then carried through it’s range of motion and the physician will immediately notice how much looser the joint is. It will often feel just like oil has been injected into the joint. Of course the joint pain is usually gone or greatly decreased.

I should mention here that I always ask the patient if they are allergic to Procaine (Novocain) or Lidocaine (Xylocaine) before giving the injections. Should they be allergic to both of these solutions I would them use Carbocaine which is Mepivacaine HCL or Marcaine which is Bupivacaine HCL. I use 2% of each, but these anesthetic agents have a much longer lasting effect, and if the dizziness or drunk feeling develops, it may take 3-4 hours for this effect to wear off.

Also, I explain to the patients that there will be some soreness at the injection sites for 2-3 days but it will go away after that. I also mention to my patients that sometimes while giving the injections, small blood vessels may be severed in the process of injecting the nerves and should this happen, some bleeding under the skin may cause bruising or ecchymoses to occur and if this happens, the patient should apply moist, hot packs to the bruised area each day and I assure the patient not to worry as these areas of discoloration will go away even though it may be visible for 2-3 weeks.
BEFORE IT TOTALLY DISAPPEARS.

MANY PATIENTS HAVE INSURANCE AND NEED THE INSURANCE PAPERS FILED OUT FOR THE INJECTIONS. HOWEVER, MANY INSURANCE COMPANIES WILL NOT PAY FOR THE INTRANEURAL INJECTIONS AS THEY CONSIDER THIS TREATMENT "EXPERIMENTAL". WHEN THIS SITUATION ARISES, WHILE GIVING THE INJECTIONS, I USUALLY ALSO INJECT A SMALL AMOUNT OF THE SOLUTION INTO THE JOINT ITSELF SO THE ACCEPTABLE TREATMENT OF ARTHROCENTESIS CAN BE HONESTLY SHOWN ON THE INSURANCE PAPERS AND THEY WILL USUALLY PAY FOR THIS PROCEDURE WITHOUT ANY PROBLEMS. SOME INSURANCE COMPANIES HOWEVER, DO PAY FOR INJECTING INTO A TENDON SHEATH, LIGAMENT OR TRIGGER POINT BUT THE PAYMENTS ARE USUALLY LESS.

NOW, I WOULD LIKE TO POINT OUT TO YOU AND SHOW YOU WHERE THE NERVES ARE LOCATED AT THE VARIOUS JOINT SITES AND IN DOING THIS I WILL TRY TO MENTION THE AREAS OF PAIN THAT ARE PRODUCED WHEN THESE PARTICULAR NERVES ARE INVOLVED. EACH OF YOU WILL BE GIVEN A SET OF DIAGRAMS THAT WILL BE LABELED WHICH WILL SHOW THE ANATOMICAL LOCATIONS WHERE THE INFLAMED NERVES ARE USUALLY FOUND AND ON SEVERAL OF THE ANATOMIC CHARTS YOU WILL NOTICE SOME STARS. THE STARS WILL REPRESENT THE MOST IMPORTANT AND MOST FREQUENTLY FOUND POINTS OF INFLAMMATION THAT ARE USUALLY QUITE EASILY LOCATED. THERE WILL ALSO BE NOTICED SMALL BLACK CIRCLES WHICH WILL DEMONSTRATE OTHER AREAS WHERE TENDERNESS OF THE NERVES CAN BE FOUND. THESE ANATOMICAL CHARTS WILL BE LISTED AS FIGURE 1 THROUGH FIGURE 21 AND YOU WILL BE GIVEN A SUMMARY SHEET WHICH WILL SUMMARIZE EACH AREA, JOINT OR NERVE THAT IS COMMONLY INVOLVED. THIS WILL ENABLE YOU OR ANY PHYSICIAN TO QUICKLY LOCATE AND IDENTIFY THE AREAS OF TENDERNESS AND NERVES AND THIS SUMMARY WILL ALSO MAKE IT VERY EASY FOR EACH OF YOU TO BEGIN USING THESE TECHNIQUES IMMEDIATELY IN YOUR PRACTICES.

I HAVE BROKEN THESE INJECTIONS DOWN INTO 9 DIFFERENT AREAS OF THE BODY AND MOST ALL INVOLVED JOINTS ARE LOCATED IN ONE OR ANOTHER OF THESE AREAS. AT THIS TIME I WOULD LIKE TO SPECIFICALLY GO OVER THESE PARTICULAR AREAS AND THE JOINTS THAT ARE INVOLVED IN EACH.

1. FIRST, I WILL DISCUSS THE CERVICAL SPINE, HEAD AND NECK. THESE NERVES ARE PORTRAYED IN FIGURES 1-2-3-4 AND 5 OF YOUR DISPLAY CHARTS.

A. THE GREATER OCCIPITAL NERVE WHEN INVOLVED MAY CAUSE HEADACHE OR PAIN IN THE HEAD AND CAN BE SEEN TO CAUSE PAIN USUALLY IN THE BACK OF THE HEAD, BUT I HAVE SEEN INFLAMMATION OF THIS NERVE CAUSE PAIN FROM THE TOP OF THE HEAD TO THE LOWER PART OF THE NECK AND MAY EXTEND LATERALLY TO EITHER EAR AREA. THE MEDIAL BRANCH IS THE MOST COMMON SITE OF TENDERNESS AND IS USUALLY ABOUT 1/2 INCH LATERAL TO THE OCCIPITAL PROTRUBANCE AND SLIGHTLY INFERIOR TO THE PROTRUBANCE ON EITHER SIDE. THIS IS USUALLY WHERE THE INJECTIONS ARE GIVEN IF TENDER TO PALPATION. THIS INJECTION MAY BE QUITE PAINFUL, SO I USUALLY HAVE THE PATIENT IN THE PRONE POSITION.

B. THE LESSER OCCIPITAL NERVE MAY CAUSE PAIN IN THE LOWER PART OF THE NECK OR HEADACHE BEHIND AND MEDIAL TO THE EAR. THE TENDER AREA IS USUALLY ABOUT 1/2 INCH MEDIAL TO THE MASTOID PROCESS AND SLIGHTLY INFERIOR AND WHEN TENDER I INJECT AT THIS POINT.

C. THE THIRD OCCIPITAL NERVE ARISES FROM THE POSTERIOR RAMI OF THE THIRD CERVICAL NERVE AND CAUSES PAIN IN THE NECK AND LOWER PART OF THE POSTERIOR HEAD. IT IS LOCATED APPROXIMATELY 2 CM LATERAL TO THE SPINOUS PROCESS OF THE SECOND CERVICAL VERTEBRAE AND IS USUALLY ONLY ABOUT 1/2 INCH TO NO MORE THAN ONE INCH DEEP AND IT IS VERY CLOSE TO THE VERTEBRAL ARTERY SO ONE SHOULD BE CERTAIN TO ASPIRATE THE NEEDLE BEFORE MAKING THE INJECTION.

D. THE GREAT AURICULAR NERVE USUALLY IS LOCATED ABOUT 2-1/2 INCHES BELOW THE EAR AND IS NEAR THE POSTERIOR BORDER OF THE STERNOCLEIDOMASTOID MUSCLE. THE EXTERNAL JUGULAR VEIN IS IN VERY CLOSE PROXIMITY TO THIS NERVE AND AFTER INJECTING IT, PRESSURE SHOULD BE APPLIED FOR A MINUTE OR SO, OTHERWISE A LARGE ECCHYMOSIS COULD DEVELOP. WHEN THIS NERVE IS INVOLVED, THERE IS USUALLY PAIN IN THE SIDE OF THE NECK AND ON THE SIDE OF THE NECK WHICH CAN EXTEND UP TO THE EAR, CHEEK AREA AND LOWER JAW. I HAVE SEEN IMPROVEMENT IN PATIENTS WITH TRIGEMINAL NEURALGIA, BELL'S PALSY AND TEMPEROMANDIBULAR JOINT DYSFUNCTION WHEN THIS NERVE IS INVOLVED.

E. WITH THE POSTERIOR PRIMARY RAMI NERVES OF C-2 THROUGH C-7 PAINS IN THE NECK USUALLY OCCUR. I USE DEEP PALPATION ABOUT 1-1/2 TO 2CM. LATERALLY AND BILATERALLY FROM C-2 THROUGH C-7 TO TRY TO LOCATE ANY TENDER AREAS AND IF ANY ARE LOCATED, I INJECT THESE AREAS OF TENDERNESS.

THORACIC AND LUMBAR SPINE

2. WITH THE THORACIC AND LUMBAR SPINE, PAIN FIGURES 1, 2, AND 6 SHOULD BE NOTED. I WILL APPLY DEEP PRESSURE BILATERALLY AT THE LEVEL OF EACH VERTEBRAE ABOUT 1-1/2 TO 2-1/2 CM LATERALLY FROM T-1. THROUGH L-4 WITH THE PATIENT IN THE PRONE POSITION. IF ANY TENDER AREAS ARE LOCATED, FIGURE 6 DEMONSTRATES THE INJECTION TECHNIQUE AND THESE INJECTIONS ARE QUITE SIMPLE, BUT AGAIN, YOU SHOULD REVIEW YOUR ANATOMY TO UNDERSTAND THE LOCATION OF
THE TRANSVERSE PROCESSES TO THE SPINOUS PROCESSES OF THESE VERTEBRAE. I USUALLY PENETRATE UNTIL I HIT THE TRANSVERSE PROCESS. THEN REDIRECT THE NEEDLE MEDially AND INJECT ABOUT 2 C.C. OF SOLUTION IN THE AREA JUST SUPERFICiALLY TO THE BONE ITSELF. THESE INJECTIONS ARE VERY GOOD FOR TREATING PATIENTS WHO HAVE SPRAINED THEIR BACKS BY LIFTING HEAVY OBJECTS OR BY SIMPLY BENDING OVER AND TWISTING THEIR THORACIC SPINE. OF COURSE, ONE MUST DIFFERENTIATE THIS PAIN FROM THE PAIN OF INTERCOSTAL NEURITIS, CARDiAC PAIN, PLEURiSy PAIN, PAINS FROM BONE METASTASiS, ETC.

LUMBOSACRAL AREA

3. 1 HAVE FOUND, THAT INFLAMED NERVES AROUND THE LUMBOSACRAL SPINE ARE THE MAJOR CAUSE OF SCIATIC TYPE PAINS INSTEAD OF INTER VERTEBRAL DISC PATHOLOGY. THESE AREAS ARE CLEARLY SHOWN IN FIGURES 1,2,14,15,16,17, 18 AND 21, AND SHOULD BE CAREFULLY STUDIED BECAUSE MUCH LOW BACK PAIN AND SUFFERING CAN BE RELIEVED BY USING THESE SIMPLE INJECTION TECHNIQUES BEFORE PERFORMING EXPENSIVE TESTS, SUCH AS X-RAYS, MYELOGRAMS, CAT SCANS AND nUCLEAR MAGNETiC IMAGING STUDiES.

YOU CAN SAVE YOURSELF A GREAT DEAL OF TIME AND SAVE THE PATIENTS MUCH MONEY AND DISABILITY IF YOU WILL SIMPLY TRY THESE TECHNIQUES IN YOUR OFFICE FIRST, BEFORE ORDERING THE EXPENSIVE TESTS I PREVIOUSLY MENTIONED. SHOULD THESE TECHNIQUES FAIL TO CORRECT THE PROBLEM, YOU CAN THEN ORDER THE STUDIES WITHOUT ENDANGERING THE PATIENT IN THE VAST MAJORITY OF CASES.

A. THE POSTERIOR PRIMARY RAMI OF L-1-2-3 AND SOMETIMES L-4 FORM THE SUPERIOR CLUNIAL NERVES. I EASiLY LOCATE THESE NERVES BY FIRST IDENTIFYING THE ILiAc CRESTS WITH THE PATIENT IN A PRONE POSITION AND THEN I APPLY DEEP PRESSURE WITH MY THUMB ABOUT 1/2 INCH CAUDAD TO THE UPPER RIM OF THE CRESt, ALONG THE ENTIRE BORDER OF THE CRESt. I MARK THE SKIN AT THESE TENDER AREAS AND USUALLY USE A 2 INCH NEEDLe (3 INCHES IF OBESE) AND TRY TO PEnETRATE DOWN TO THE BONE OF THE ILiUM WING. I THEN MOVE ACROSS THE ILiUM WING AND HAVE THE PATIENT NOTIFY ME IF THEY FEEL THE SHARP PAIN WHEN THE NERVE IS LOCATED. I INJECT AS MANY AS ARE TENDER AND I’VE FOUND THE SUPERIOR CLUNiAL NERVES ARE VERY COMMONLY THE CAUSE OF SCIATIC PAIN AND LOW BACK PAIN. I’VE ALSO SEEN THE PROBLEM ARISE QUITE OFTEN WHEN PATIENTS ARE SITTING UP AND RIDING IN AN AUTOMOBILE FOR SEVERAL HOURS OR WHEN A WOMAN IS MAKING A BED AND REACHES AND STRETCHES TO GRAB A PILLOW ON THE FAR SIDE OF THE BED, THESE CASES RESPOND BEAUTiFULLY TO THIS TREATMENT.

B. THE POSTERIOR PRIMARY RAMI OF S-1-2 AND 3 MAY BECOME INFLAMED AND THESE NERVES ARE KNOWN AS THE MEDiAL CLUNiAL NERVES. WHEN INFLAMED, THEY NEARLY ALWAYS CAUSE LOW BACK PAIN AS WELL AS SCIATIC PAIN. THEY ARE EASiLY LOCATED AND I FIRST IDENTIFY THE ‘DIMPLE’ 2-3 INCHES LATERAL TO THE MIDLINE AT THE LEVEL OF S-1 WHILE THE PATIENT IS IN THE PRONE POSITION AND THE 1ST MIDDLE CLUNiAL NERVE (S-1) IS SLIGHTLY LATERAL TO THE ‘DIMPLE’. S-2 IS 1 - 1-1/2 INCHES INFERIOR AND SLIGHTLY MEDiAL TO THE S-1 AND S-3 IS 1 - 1-1/2 INCHES INFERIOR AND SLIGHTLY MEDiAL TO S-2. THE NERVES ARE LYING RIGHT ON TOP OF THE SACRUM AND I INJECT WHEREVER THEY ARE TENDER.

C. THE COCCYGeAL NERVE IS LOCATED JUST LATERAL TO THE COCCXYX AND WHEN INVOLVED, CAN EASiLY BE FOUND. WHEN THIS NERVE IS INFLAMED, I’VE FOUND THE PATIENT HAS PAIN IN THE COCCXYX AND RECTUM AREA AND THE PAIN IS USUALLY INTENSIFIED OR AGGRAVATED BY PROLONGED SITTING AND ESPECiALLY SITTING ON ANY HARD SURFACES.

D. THE IIOiHYPOGAStRIC NERVE WHEN INFLAMED MAY CAUSE PAIN IN THE LOWER ABDOMEN ABOVE THE INGUINAL LIGAMENT OR IN THE UPPER POSTERio-LATERAL ASPECT OF THE BUTTOCKS. IT IS FAIRLY DEEP TO THE SKIN AND IS OftEN FOUND JUST POSTERiOR AND SOMETIMES SUPERiOR TO THE ANTERio-SUPERiOR ILiAc SPINE. A 2 INCH NEEDLe WILL REACH THIS POINT VERY EASiLY. I’M NOT SURE, BUT I BELiEVE THAT EXCESSiVE SIDE BENDING AND STRETCHiNG THIS NERVE, MAY PLAY A PART IN CAUSING THE INJURY, ESPECiALLY WHERE THE GLUTEUS MEDIUM MUSCLE iS EXCESSiVELy PULLED.

E. THE IIOiINGUINAL COMES THROUGH THE INGUINAL CANAL DEEP TO THE SPERMATIC CORD AND SUPPLIES THE SKIN OF THE SUPERio-MEDiAL ASPECT OF THE THiGh AS WELL AS LATERAL SIDE OF THE PENiS AND SCROTUM AND THE MONS PUbiS IN WOMEN. DEEP PRESSURE ALONG THE MEDiAL ASPECT OF THE INGUINAL LIGAMENT WHEN INVOLVED WILL ELiCIT THE TENDERNESS ALONG THIS NERVE BUT CARE SHOULD BE TAKEN TO PAlPATE THE FEMORAL ARTERy AND NOT PEnETRATE IT WHEN GIVING THE INJECTION. OTHERwiSE THE SOLUTION COULD BE INJECTED INTRA-ARTERiALLY. IT MAY BE LOCATED SLIGHTLY SUPERIO OR INFERIOR TO THE INGUINAL LIGAMENT AND THE PRESSURE SHOULD BE APPLIED ALONG THE MEDiALLY. THE PRESSURE IS PLACED, THE MORE INFERiORALLY THE NERVE IS USUALLY FOUND. THE GENiTO FEMORAL NERVE IS VERS OCELY ASSOCIATED HERE AND MAY BE INVOLVED IN CAUSING SCROTAL AND MONS PUBiS PAIN AS WELL AS THE MID ANTERIO THIGH JUST BELOW THE INGUINAL LIGAMENT AND THIS GENiTO FEMORAL NERVE IS USUALLY SOMEWHAT MEDiAL TO THE IIOiINGUINAL AND IT ALSO SUPPLIES THE CREMATiERIC MUSCiLES.

F. THE LATERAL FEMORAL CUTANEOUS NERVE TO THE THiGh PAssES ABOUt 1-2 CM MEDiAL TO THE

SHOULDER JOINT

4. NOW WE WILL ADDRESS THE SHOULDER AREA AND SHOULDER JOINT. THERE ARE AT LEAST 8 AREAS THAT SHOULD BE THOROUGHLY EXAMINED WHEN ANY PATIENT COMPLAINS OF PAINS IN THE SHOULDER AREA. THESE AREAS ARE DEPICTED IN FIGURES 1,2,3,4,5,7, 8,9,10, AND 13 IF YOU ARE TO CHECK OUT ALL POSSIBLE AREAS. NOW I WILL DISCUSS THESE SPECIFIC NERVES.

A. THE AXILLARY NERVE ORIGINATES FROM C-5 AND C-6 OF THE BRACHIAL PLEXUS AND BEFORE IT GOES AROUND THE SURGICAL NECK OF THE HUMERUS IT DIVIDES INTO AN ANTERIOR BRANCH AND A POSTERIOR BRANCH AND GIVES OFF 2-3 ARTICULAR FILAMENTS TO THE JOINT ITSELF.

THE ANTERIOR BRANCH PENETRATES DEEP TO THE DELTOID MUSCLE AND FINALLY WILL PIERCE THE DELTOID AND SUPPLY THE DELTOID MUSCLE, THE SKIN ON THE ANTERIOR SURFACE OVERLYING THE DELTOID MUSCLE. THE AREA OF TENDERNESS MOST COMMONLY FOUND IS USUALLY ABOUT ONE INCH SUPERIOR AND SLIGHTLY LATERAL TO THE ANTERIOR AXILLARY FOLD OR ARMPIT. THIS NERVE CAN CAUSE MUCH DISABILITY OF THE SHOULDER JOINT.

B. THE CIRCUMFLEX OR CIRCUMFLEX HUMERAL NERVE IS IN REALITY THE POSTERIOR BRANCH OF THE PREVIOUSLY MENTIONED AXILLARY NERVE AND IT'S TERMINAL BRANCH IS KNOWN AS THE UPPER LATERAL CUTANEOUS NERVE OF THE ARM AND SUPPLIES THE SKIN FROM THE ANTERIOR PORTION OF THE DELTOID ALL THE WAY AROUND POSTERIALLY TO AN AREA PAST THE TRICEPS MUSCLE. THE MOST COMMON AREA OF TENDERNESS WHICH MAY DISABLE THE SHOULDER JOINT IS USUALLY FOUND ABOUT 1" ABOVE AND SOMETIMES SLIGHTLY MEDIAL TO THE POSTERIAL AXILLARY FOLD OR ARMPIT CREASE WHERE IT SHOULD ALWAYS BE CHECKED FOR TENDERNESS.

C. THE UPPER LATERAL CUTANEOUS NERVE OF THE ARM IS A CONTINUATION OF THE CIRCUMFLEX NERVE AND AREAS OF TENDERNESS SHOULD BE SOUGHT BY APPLYING DEEP PRESSURE ALL AROUND THE DELTOID MUSCLE FROM THE ANTERIOR TO THE POSTERIOR PORTION ALL ALONG THE LATERAL BORDER AND ANY TENDER AREAS SHOULD BE INJECTED.

PRIMARY AREAS. ONE AREA IS ON THE POSTERIOR SURFACE OF THE DELTOID MUSCLE JUST LATERAL TO THE POSTERIOR PORTION OF THE SHOULDER GIRDLE. ANOTHER COMMON AREA OF TENDERNESS IS JUST ANTERIOR TO THE TRAPEZIUS MUSCLE ABOUT ONE TO 1-1/2 INCHES LATERALLY TO THE BASE OF THE NECK AND ABOUT 1-1/2 INCHES SUPERIOR TO THE CLAVICLE (SEE EXHIBIT 3 AND 4). THIS NERVE CAN CAUSE PAIN FROM THE SHOULDER TO THE SIDE AND BACK OF THE HEAD ON THE AFFLICTED SIDE. THIS IS A VERY COMMON SITE OF TENDERNESS. THE INTERMEDIATE SUPRACLAVICULAR NERVE IS VERY COMMONLY VERY TENDER IN MOST ALL PATIENTS WITH ARTHRITIS OF THE SHOULDER. IT IS USUALLY FOUND BY PLACING PRESSURE ANTERIOR TO THE HEAD OF THE HUMERUS BUT OCCASIONALLY IT IS SLIGHTLY ANTERIOR MEDIALLY TO THE HUMERUS HEAD. WHEN INVOLVED, IT IS VERY IMPORTANT TO INJECT THIS NERVE TO RELIEVE THE SHOULDER PAIN.

5. THE ELBOW JOINT HAS 4 MAIN NERVES THAT MAY BE INVOLVED IN CAUSING ELBOW PAIN. EACH OF THESE NERVES SHOULD BE EXAMINED WHEN EVALUATING ELBOW PAIN.

A. THE LATERAL CUTANEOUS NERVE OF THE FOREARM IS A CONTINUATION OF THE MUSCULO-CUTANEOUS NERVE WHICH GIVES OFF SMALL FILAMENTS THAT INNERVATE THE ELBOW JOINT. THE MOST COMMON AREA OF TENDERNESS OF THIS NERVE IS USUALLY ON THE LATERAL EDGE OF THE ANTECUBITAL FOSSA ABOUT 1 TO 1-1/2 INCHES MEDIALLY TO THE OUTER ASPECT OF THE LATERAL SURFACE OF THE ELBOW. THERE IS ALSO A FAIRLY COMMON AREA OF TENDERNESS APPROXIMATELY 2 TO 2-1/2 INCHES DISTALLY FROM THIS PREVIOUSLY MENTIONED TENDER POINT AS A BRANCH OF THIS NERVE COMMUNICATES WITH A BRANCH FROM THE POSTERIOR CUTANEOUS NERVE OF THE FOREARM. EITHER OF THESE AREAS WILL CAUSE ELBOW PAIN AND SHOULD BE EVALUATED.


6. WITH PATIENTS SUFFERING FROM WRIST AND HAND PAIN, THERE ARE USUALLY THREE MAIN NERVES INVOLVED. I WILL DISCUSS THEM SEPARATELY.

A. BY FAR THE MOST COMMON NERVE INVOLVED IN WRIST AND HAND PAIN IS INFLAMMATION OF THE POSTERIOR INTEROSSEOUS GANGLION WHICH SENDS BRANCHES TO JOINTS OF ALL THE FINGERS. THIS NERVE ORIGINATES FROM THE RADIAL NERVE AND THE GANGLION IS EASILY LOCATED. I USE THE ERASER END OF A REGULAR PENCIL TO APPLY PRESSURE TO IDENTIFY THE GANGLION. IT IS USUALLY LOCATED ABOUT 1/4-1/2 INCH MEDially TO THE ULNAR STYLOID PROCESS AND 1/4 TO 1/2 INCH DISTALLY TO THIS AREA. I BEGIN PRESSING WITH THE PENCIL AND GRADUALLY COVER THE AREA ABOUT THE SIZE OF A NICKLE AND MARK THE MOST TENDER AREA FOR INJECTION.

B. SHOULD THE ABOVE INJECTION FAIL TO RELIEVE PAINS IN THE HAND, I CHECK FOR TENDERNESS OF THE ANTERIOR INTEROSSEOUS NERVE. IT IS LOCATED WHEN AFFECTED BY PROCEEDING DISTALLY FROM THE ANTECUBITAL FOSSA ON THE VENTRAL SURFACE OF THE FOREARM ABOUT 2 TO 3 INCHES AND APPLYING DEEP PRESSURE. THIS NERVE IS FAIRLY DEEP AND I USUALLY USE A 1-1/2 INCH NEEDLE TO FIND THE NERVE. THIS NERVE IS SOUGHT ONLY IF THE INJECTION INTO THE POSTERIOR INTEROSSEOUS GANGLION FAILS TO RELIEVE PAIN IN THE HAND OR FINGERS.

C. WHEN PAIN IN THE THUMB IS INVOLVED, I USE THE PENCIL ERASER TO CHECK THE AREAS AS DEPICTED ON FIGURES 9, 10, AND 12 TO APPLY PRESSURE ON THE MEDIAL AND LATERAL TERMINAL BRANCHES OF THE RADIUS NERVE. INJECTING THESE TENDER AREAS WILL USUALLY RELIEVE THE PAINS ASSOCIATED WITH ARTHRITIS LOCATED IN THE THUMB.

E. OCCASIONALLY AFTER INJECTING THE POSTERIOR INTEROSSEOUS GANGLION, THE PATIENT WILL CONTINUE TO EXPERIENCE PAIN IN THE LITTLE FINGER. WHEN THIS OCCURS, I USE THE PENCIL
ERASER TO LOCATE THE DORSAL BRANCH OF THE ULNAR NERVE AS DEPICTED ON FIGURES 9 AND 10 AND IF TENDER, WILL INJECT THIS NERVE.

HIP JOINT

7. WITH THE HIP JOINT INVOLVED WITH ARTHRITIS PAIN, THE OBTURATOR NERVE AND ITS BRANCHES SEEM TO BE THE PRIMARY NERVES INVOLVED, ALTHOUGH THE LATERAL FEMORAL CUTANEOUS NERVE TO THE THIGH IS ALSO OFTEN INVOLVED IN HIP JOINT ARTHRITIS PAIN, ESPECIALLY WHEN IT IS DIFFICULT TO FLEX OR EXTEND THE HIP JOINT. THIS NERVE SHOULD BE CHECKED ABOUT ONE INCH MEDIAL TO THE ANTERIOR SUPERIOR ILIAC SPINE FOR TENDERNESS IF IT IS DIFFICULT FOR THE PATIENT TO EXTEND THE HIP OR KNEE JOINT AND PROPER INJECTIONS SHOULD BE CARRIED OUT. THERE ARE FOUR ARTICULAR BRANCHES TO THE HIP JOINT AND TWO OF THESE ARE FROM THE OBTURATOR NERVE AND THEY SHOULD BE CHECKED.

A. THE OBTURATOR NERVE AS IT ENTERS THE OBTURATOR FORAMEN GIVES OFF A BRANCH TO THE HIP JOINT. FIGURES 14,15,19 AND 20 SHOW THE APPROACH TO THE OBTURATOR NERVE IN THE OBTURATOR FORAMEN AND THIS NERVE MAY OR MAY NOT BE TENDER TO DEEP PALPATION. THE BEST APPROACH IS TO FIRST LOCATE THE PUBIC SPINE ON THE SIDE TO BE INJECTED. MARK AN X IN A LOCATION 1/2 INCH LATERAL AND 1/2 CAUDAL TO THE PUBIC SPINE. THIS X IS DEADENED WITH THE MADAJET, USING A 3 INCH 22 GAUGE NEEDLE, INJECT ABOUT 5 C.C. OF THE SOLUTION AS LOCAL INFILTRATION AS THE NEEDLE IS PUSHED STRAIGHT DOWN AND PERPENDICULAR TO THE BODY UNTIL THE SUPERIOR RAMUS OF THE PUBIC BONE IS CONTACTED. AFTER 5 MINUTES, REINSERT THE NEEDLE STRAIGHT DOWN TO THE PUBIC RAMUS, THEN WITHDRAW THE NEEDLE 3/4 TO 1 INCH AND REDIRECT THE NEEDLE SUPERIORALLY AND LATERALLY AT AN 80 DEGREE ANGLE TO THE SKIN AND ADVANCE THE NEEDLE UNTIL YOU FEEL IT SLIP INTO THE OBTURATOR FORAMEN. IT IS BEST TO USE ABOUT 8-10 C.C. OF THE SOLUTION TO INJECT THIS NERVE AND ALWAYS ASPIRATE BEFORE INJECTING.

B. THE OBTURATOR NERVE GIVES OFF A BRANCH FROM A POSTERIOR BRANCH THAT GOES TO THE ANTERIOR SURFACE OF THE GREATER TROCHANTER. DEEP PALPATION OVER THE ANTERIOR SURFACE OF THE GREATER TROCHANTER WILL REVEAL TENDERNESS IF THIS NERVE IS INVOLVED. USUALLY A 3 INCH NEEDLE IS USED TO PENETRATE 2-3 AREAS JUST SUPERFICIALLY TO THE ANTERIOR SURFACE OF THE GREATER TROCHANTER AND 1-2 C.C. OF SOLUTION IS FANNED OUT IN EACH AREA FOR THE BEST RESULTS.


D. THERE IS AN ARTICULAR BRANCH ALSO GIVEN OFF OF THE SACRALPLEXUS THAT GOES TO THE QUADRATUS FEMORIS MUSCLE AS SHOWN IN FIGURES 16,17 AND 21. DEEP PRESSURE IS APPLIED TO THE POSTERIOR PART OF THE GREATER TROCHANTER AND AFTER THE TENDER POINT IS LOCATED, A 3 INCH NEEDLE IS PUSHED INTO THE POSTERIOR MEDIAL ASPECT OF THE GREATER TROCHANTER AND SEVERAL SMALL INJECTIONS ARE MADE IN A FAN LIKE FASHION IN THE AREA JUST SUPERFICIAL TO THE MEDIAL PORTION OF THE GREATER TROCHANTER TO REACH THIS NERVE.

E. THE LATERAL FEMORAL CUTANEOUS NERVE OF THE THIGH HAS ALREADY BEEN EXPLAINED UNDER THE SECTION UNDER LUMBO SACRAL PAIN AND THIS NERVE OFTEN INVOLVES THE HIP JOINT.

KNEE JOINT

8. CONCERNING THE KNEE JOINT, THERE ARE SEVERAL NERVES INVOLVED AND EACH OF THEM ARE QUITE IMPORTANT. FIGURES 14,15,16 AND 17 WILL SHOW THESE NERVES AS FAR AS THEIR LOCATION AND HOW YOU WILL BE ABLE TO IDENTIFY THEM EASIER.

A.B.C.D. THE SAPHENOUS NERVE HAS SEVERAL IMPORTANT AREAS THAT SHOULD BE DISCUSSED. THE SAPHENOUS NERVE BEGINS AT HUNTER’S CANAL (SEE FIGURES 14 AND 15) AND THIS IS LOCATED ON THE MEDIAL ASPECT OF THE THIGH, APPROXIMATELY 6 TO 8 INCHES PROXIMAL TO THE KNEE. THIS AREA IS OFTEN VERY TENDER TO DEEP PALPATION AND IS ONE OF THE AREAS THAT IS INJECTED IF TENDER. I FOLLOW THIS SAPHENOUS NERVE ON DOWN TO BELOW THE KNEE BY APPLYING DEEP PRESSURE EVERY 1-1/2 TO 2 CENTIMETERS AS I TRAVEL DISTALLY ON DOWN THE MEDIAL ASPECT OF THE UPPER THIGH AND THE MEDIAL ASPECT OF THE KNEE ITSELF. JUST MEDIAL TO THE MID PORTION OF THE KNEE IS THE MEDIAL LONGITUDINAL LIGAMENT (WHICH IS ALSO KNOWN AS THE TIBIAL COLLATERAL LIGAMENT) AND THIS IS ONE OF THE MOST IMPORTANT POINTS OF TENDERNESS, BECAUSE IT IS AT THIS AREA THAT THE SAPHENOUS NERVE RECEIVES IT’S GREATEST AMOUNT OF STRAIN WHEN THE LEG IS USED IN WALKING OR TWISTING. THIS AREA SHOULD BE SOUGHT FOR TENDERNESS AND JUST BELOW THIS AREA, THE SAPHENOUS NERVE GIVES OFF THE INFRAPATELLAR BRANCH WHICH BEGINS TO APPROACH THE ANTERIOR PORTION OF THE KNEE. IT DIVIDES INTO TWO OR THREE BRANCHES WHICH END APPROXIMATELY 1 TO 1-1/2 INCH MEDIAL TO THE ANTERIOR SURFACE OF THE TIBIA AND IT IS IN THESE AREAS THAT I OFTEN FIND THE NERVES ARE EXTREMELY TENDER. I USUALLY BEGIN PRESSURE ABOUT SIX INCHES BELOW THE KNEE AND APPROXIMATELY 1 INCH MEDIAL TO THE ANTERIOR...
SURFACE OF THE TIBIA AND PROCEED CEPHALAD AND USING PRESSURE EVERY ONE HALF TO ONE INCH UNTIL I REACH THE PATELLA REGION. ALL TENDER AREAS ARE MARKED IN THIS AREA AND ALONG THE ENTIRE COURSE OF THE SAPHENOUS NERVE AS ALREADY EXPLAINED. THESE ARE THE MOST IMPORTANT AREAS FOR PAIN IN THE KNEE AND I SOMETIMES FIND ONLY ONE BUT HAVE OFTEN FOUND SIX OR SEVEN AREAS OF TENDERNESS ALONG THE SAPHENOUS NERVE ITSELF AND THE INFRAPATTELAR BRANCHES.

E. THE LATERAL CUTANEOUS NERVE TO THE THIGH. THIS IS A CONTINUATION OF THE NERVE PREVIOUSLY DISCUSSED UNDER LUMBO SACRAL SPINE AND WHERE IT WAS REFERRED TO AS THE LATERAL FEMORAL CUTANEOUS NERVE TO THE THIGH. I HAVE ALREADY DESCRIBED HOW TO EXAMINE THAT NERVE AND FIND THE TENDER POINTS, SO I WILL NOT GO INTO IT AGAIN.

F. THE INTERMEDIAL CUTANEOUS NERVE TO THE THIGH. THIS NERVE DESCENDS ON THE ANTERIOR SURFACE OF THE THIGH, SENDING OFF NUMEROUS BRANCHES TO THE RIGHT AND LEFT IN IT'S DESCENTION. I HAVE FOUND THAT THE TENDER AREAS, IF PRESENT ARE USUALLY LOCATED ABOUT ONE TO TWO INCHES ABOVE THE PATELLA AND APPROXIMATELY ONE HALF TO ONE INCH MEDIAL OR LATERAL TO THE MID ANTERIOR LINE. THESE AREAS SHOULD BE MARKED IF TENDER AND INJECTED AS PREVIOUSLY SUGGESTED.

G. THE MEDIAL CUTANEOUS NERVE TO THE THIGH. THIS NERVE DESCENDS ON THE ANTERIOR MEDIAL ASPECT OF THE THIGH DOWN TO THE KNEE ITSELF. IT IS NOT OFTEN INVOLVED. BUT WHEN IT IS INVOLVED, I FIND THE TENDERNESS IS USUALLY APPROXIMATELY TWO INCHES TO TWO AND A HALF INCHES MEDIAL TO THE MID ANTERIOR LINE OF THE THIGH AND APPROXIMATELY ONE INCH ABOVE THE PATELLA. IF TENDER IT IS INJECTED AS USUAL.

H. THE LATERAL CUTANEOUS NERVE TO THE CALF IS QUITE OFTEN INVOLVED AND THERE IS ONE MAIN PLACE OF TENDERNESS THAT I USUALLY FIND IF THIS NERVE IS AFFECTED. THIS AREA OF TENDERNESS IS USUALLY RIGHT IN THE VERY MIDDLE OF THE KNEE ON THE EXTREME LATERAL SIDE OF THE KNEE WHERE PRESSURE WILL ELICIT MODERATELY SEVERE PAIN IN THIS AREA. IF TENDER, THE NERVE IS MARKED AND THE INJECTIONS ARE GIVEN.


ANKLE AND THE FOOT

9. IT IS QUITE COMMON FOR PATIENTS TO HAVE ARTHRITIS OF THE ANKLE AND FOOT, AS WELL AS THE TARSAL AND METATARSAL BONES. ARTHRITIS IN THESE AREAS RESPONDS VERY WELL TO THE INTRANEURAL INJECTIONS IF PROPERLY APPLIED.

A. B. C. THE SAPHENOUS NERVE IS ONE OF THE PRIMARY NERVES INVOLVED IN ANKLE AND FOOT PAIN. VERY OFTEN THE TERMINAL BRANCHES OF THE INFRAPATTELAR NERVE CAN HAVE AN EFFECT ON THE ANKLE JOINT IF THEY ARE TENDER. ALSO I HAVE NOTICED THAT APPROXIMATELY THREE AND A HALF TO FOUR INCHES BELOW THE PATELLA, RIGHT ON THE ANTERIOR SURFACE OF THE TIBIA, A TENDER AREA IS OFTEN FOUND THAT DEFINITELY AFFECTS THE ANKLE JOINT. THE SAPHENOUS NERVE PROCEEDS FROM THE KNEE DOWN THE LATERAL ASPECT OF THE FORELEG AND PROCEEDS SLIGHTLY ANTERIOR TO AN AREA. WHERE IT RUNS ANTERIOR TO THE MEDIAL MALLEOLUS OF THE TIBIA. APPROXIMATELY ONE HALF TO THREE QUARTERS OF AN INCH ANTERIOR TO THE MEDIAL MALLEOLUS AND APPROXIMATELY ONE AND A HALF INCHES CEPHALAD, IS AN AREA THAT IS OFTEN QUITE TENDER. THIS IS ON THE SAPHENOUS NERVE AND APPROXIMATELY ONE AND A HALF INCHES CEPHALAD TO THIS, ANOTHER AREA OF TENDERNESS CAN OFTEN BE FOUND.

D. THE ANTERIOR TibIAL NERVE IS OFTEN INVOLVED AND IT IS FOUND BY DEEP PALPATION IN THE CENTER OF THE ANTERIOR CREASE WHICH SEPARATES THE ANKLE FROM THE LOWER LEG. DEEP PALPATION WILL OFTEN ELICIT FAIRLY SEVERE TENDERNESS AND WHEN INJECTING THIS ANTERIOR TibIAL NERVE, I USUALLY USE A ONE INCH NEEDLE AND GO RIGHT DOWN TO THE BONE AND SPREAD THE SOLUTION OFF IN A FAN SHAPE AREA BECAUSE IT IS VERY DIFFICULT TO LOCATE.

E. THE SURAL NERVE IS VERY OFTEN INVOLVED AND IT IS VERY EASILY LOCATED. THIS NERVE QUITE OFTEN CAUSES PAIN IN THE ANKLE AND ESPECIALLY IN THE HEEL AND PROXIMAL TARSAL AND METATARSAL BONES. IT IS EASILY LOCATED BY PALPATING WITH ONE'S FINGER JUST DORSAL TO THE ACHILLES TENDON ON THE LATERAL SURFACE OF THE ANKLE APPROXIMATELY ONE AND A HALF INCHES POSTERIOR TO THE LATERAL MALLEOLUS, ONE SHOULD USE CARE IN INJECTING THIS POINT TO TRY TO AVOID INJECTING ANY OF THE SOLUTION INTO THE ACHILLES TENDON ITSELF AS THE DEPO STEROID COULD WEAKEN THIS TENDON.

D. THIS DISCUSSION I BELIEVE, FAIRLY WELL CLEARLY SUMMARIZES THE ACTUAL TECHNIQUES OF GIVING THE INTRANEURAL INJECTIONS AND I CERTAINLY HOPE THAT I HAVE BEEN ABLE TO MAKE THINGS QUITE CLEAR FOR EACH OF YOU. THE HANDOUTS THAT I HAVE GIVEN TO YOU WILL DESCRIBE IN DETAIL EVERYTHING THAT I HAVE TALKED TO YOU ABOUT AND I HOPE THAT YOU WILL STUDY THEM SO THAT YOU WILL USE THE INTRANEURAL INJECTIONS IN YOUR PRACTICE FOR THE RELIEF OF YOUR PATIENTS. YOU WILL FIND THAT USING THE INTRANEURAL INJECTIONS WILL ENABLE YOU TO GIVE MUCH MORE RELIEF, NOT ONLY TO ALL ARTHRITIC PATIENTS, BUT PATIENTS AS WELL WITH ANY TYPES
OF PAIN IN THESE AREAS THAT WE HAVE DISCUSSED.

Now, I would like to ask if there are any questions that I may answer for you?
SCHEMATICS AND DIAGRAMS FOR THE ACCURATE DETERMINATION OF THE MOST COMMON AREAS OF INFLAMMATION THAT ARE INVOLVED AROUND VARIOUS JOINTS. I BELIEVE THIS IS THE ACTUAL CAUSE OF OSTEOARTHRITIS AND THE TREATMENT CONSISTS OF INTRANEURAL INJECTIONS WHEN TENDERNESS IS FOUND AFTER PRESSURE ON THESE NERVES. THESE TECHNIQUES WILL RELIEVE THE PAIN AND THE OSTEOARTHRITIS.
LIST OF NERVES USUALLY INFLAMMED WITH ARTHRITIC JOINTS
(Numbers Enclosed in Parenthesis at End of Nerves Listed, Show Exhbits Which Depict Most Common Injection Sites of That Nerve)

1. Cervical Spine and Head and Neck
   A. Greater Occipital Nerve - ½ inch lateral to occipital protuberance (1,2,3,4,5)
   B. Lesser Occipital Nerve - below and medial to mastoid process. (1,2,3,4,5)
   C. 3rd Occipital Nerve - 1-1½ inch below and lateral to occipital protuberance - Care - Superficial (1,2)
   D. Greater Auricular Nerve - On lateral side of neck, just posterior to sternocleidomastoid muscle in the midline. (3,4,5)
   E. Posterior Primary Rami C2-C7 - 1½ - 2 cm lateral to midline. (1,2)

2. Thoracic Spine
   Posterior Primary Rami T1-T12 - Located 1½ to 2½ cm from midline between spinous processes. Penetrate to the transverse process and inject 2 c.c. (1,2,6)

3. Lumbo Sacral Spine - The Main Cause of "Sciatica"
   A. Posterior Primary Rami L 1-2-3 Called Superior Clunial nerves and 3-4 present, slightly inferior to iliac crest. (2,2,16,17,18)
   B. Posterior Primary Rami S 1-2-3 Called Medial Clunial nerves from inferior portion of Posterior Superior Iliac Spine toward Coccyx. (1,2,16,17,18,21)
     May find S 4 rarely
   C. Coccygeal Nerve - lateral to Coccyx (2)
   D. Iliohypogastric Nerve - descending branch. (1,16,17)
   E. Ilioinguinal - Innervates inner thigh and Penis, Scrotum and Mons Pubis (14,15)
   F. Lateral Femoral Cutaneous Nerve to Thigh - Medial to Anterior Superior Iliac Spine (14,15)

4. The Shoulder
   A. Axillary Nerve - branches innervates posterior and inferior joint capsule. (7,8)
   B. Circumflex Nerve - becomes upper lateral cutaneous of arm. (1,2,9,10,13)
   C. Upper Lateral Cutaneous Nerve of Arm. (1,2,7,8,9,10)
   D. Lower Suprascapular Nerve - branches to posterior joint capsule. (1,2,10,13)
   E. Upper Suprascapular Nerve - branches to superior Joint Capsule and AC joint. (1,2,10,13)
   F. Posterior Supraclavicular Nerve - primarily skin over deltoid. (1,2,3,4,5,10,13)
   G. Intermediate and Anterior Supraclavicular Nerve - branches to skin over upper clavical. (3,4,7,8)
   H. Entire Scapula area where numerous nerve branches may be involved. (1,2)

5. The Elbow
   A. Lateral Cutaneous Nerve of forearm. (7,8,11)
   B. Medial Cutaneous Nerve of forearm. (7,8,11)
   C. Posterior Cutaneous Nerve of forearm. (7,8,9,10,13)
   D. Nerve to Anconeous - from Radial Nerve - often confused with Tennis elbow. (9,10,13)
6. The Wrist, Hand and Fingers
   A. Posterior Interosseous Nerve - from Radial nerve - all fingers. (9,10,13)
   B. Anterior Interosseous Nerve - from Medial Nerve. Check this if above doesn't relieve pains. (7,8,11)
   C. Medial Terminal branch of Radial to Thumb - near snuffbox. (8,9,10,11)
   D. Lateral Terminal branch of Radial - lateral to above toward thumb. (7,9,10,11)
   E. Dorsal branch of Ulnar - primarily little finger and 3/4 inch distal to styloid process. (10)

7. The Hip Joint
   A. Obturator Nerve - articular branch at obturator foramen. (14,15,19,20)
   B. Obturator Nerve - articular branch of posterior branch. Anterior to greater tuberosity. (14,15)
   C. Articular branch to Rectus Femoris - from femoral Nerve. (14,15,17,21)
   D. Articular branch to Quadratus Femoris - from sacral plexus and posterior to greater tuberosity. (17,21)
   E. Lateral Femoral Cutaneous Nerve - Medial to ASIS and may cause continual flexed knee and hip. (14,15)

8. The Knee
   A. Saphenous Nerve - Medial to tibia - may be 3-4 areas of tenderness. (14,15)
   B. Infra patellar branches - 2-4 in number. From Saphenous Nerve. (14,15)
   C. Saphenous Nerve over Medial longitudinal ligament - greatest strain area. (14,15)
   D. Saphenous Nerve entering Hunters Canal - deep. (14,15)
   E. Lateral cutaneous nerve to thigh. (14,15,16,17)
   F. Intermediate cutaneous nerve to thigh. (14,15)
   G. Medial cutaneous nerve to thigh. (14,15)
   H. Lateral cutaneous nerve to calf. (14,15,16,17)
   I. Posterior cutaneous nerve to thigh. (16,17)

9. The Ankle and Foot
   A. Saphenous Nerve - 1½-2½ inches below inferior border patella on tibia. (14)
   B. Saphenous Nerve - 1-2 inches superior to medial malleolus. (14,15)
   C. Saphenous Nerve - 2½-3 inches superior to medial malleolus. (14,15)
   D. Anterior Tibial Nerve - in mid crease of ankle and foot anterior. (deep). (14,15)
   E. Sural Nerve Dorsal to achilles tendon - causes pain under heel and foot. (16,17)
THE BACK—I: SUPERFICIAL MUSCLES
THE NERVES OF THE RIGHT SIDE OF THE SCALP, FACE AND SIDE OF NECK. STARS SHOW MOST COMMON AREAS OF NERVE TENDERNESS.
A diagram showing the cutaneous nerve supply of the face, scalp and neck.
Postero lateral view of vertebra showing emergence of Posterior primary ramus running upwards over the Pedicle (Medial Branch) and the Transverse process (Lateral Branch). The nerve is usually injected at the bifurcation of the nerve.
EXHIBIT #7.
ARM - ANTERIOR ASPECT

Supraclavicular, C.3, 4
(Intermediate Branch)

Axillary Nerve

Upper lateral cutaneous of arm, C.5, 6

Intercostobrachial, T.2

Medial cutaneous of forearm, C.8, T.1

Medial cutaneous of arm, C.8, T.1

Lower lateral cutaneous of arm, C.5, 6
Posterolateral Cutaneous Nerve to Forearm

Anterior Interosseous N. (Deep)

Lateral cutaneous of forearm, C.5, 6

Palmar branch of median

Palmar branch of ulnar

Superficial branch of radial, C.7, 8

Ulnar, C.8, T.1

Median, C.6, 7, 8

THE CUTANEOUS NERVES OF THE RIGHT UPPER LIMB, THEIR AREAS OF DISTRIBUTION AND SEGMENTAL ORIGINS, VIEWED FROM THE ANTERIOR ASPECT. NOTE COMMUNICATION AMONG ALL NERVES.
CUTANEOUS NERVES OF THE UPPER LIMB
NOTE COMMUNICATION OF ALL BRANCHES.
EXHIBIT # 9.
ARM - POSTERIOR VIEW

Supraventricular, C.3, 4
(Posterior)

Circumflex Nerve

Upper lateral cutaneous of arm,
C.5, 6

Posterior cutaneous of arm,
C.5, 6, 7, 8

Intercostobrachial, T.2

Medial cutaneous of arm, C.8, T.1

Nerve to Anconeous

Posterior cutaneous of forearm,
C.5, 6, 7, 8

Medial cutaneous of forearm,
C.8, T.1

Lateral cutaneous of forearm,
C.5, 6

Posterior Interosseous Ganglion

Medial and Lateral Radical Terminal Branches

Ulnar. C.8, T.1

Superficial branch of radial,
C.6, 7, 8

Median, C.6, 7, 8

THE CUTANEOUS NERVES OF THE RIGHT UPPER LIMB, THEIR AREAS OF DISTRIBUTION AND SEGMENTAL ORIGINS, VIEWED FROM THE POSTERIOR ASPECT.
EXHIBIT #10.

ARM - POSTERIOR VIEW

- Upper Supraspinal Nerve
- Suprascapular nerves (C. 3, 4) (Posterior)
- Lower Supraspinal Nerve
- Circumflex Nerve
- Intercosto-brachial n.
- Upper lateral cutaneous nerve of arm (Cutaneous br. of axillary n.)
- Posterior cutaneous nerve of arm
- Lower lateral cutaneous nerve of arm
- Nerve to Anconeus
- Medial cutaneous nerve of forearm, ulnar (posterior) brs.
- Posterior cutaneous nerve of forearm
- Posterior cutaneous nerve of forearm
- Lateral cutaneous nerve of forearm, posterior branch
- Posterior Interosseous Ganglion
- Dorsal (cutaneous) br. of ulnar nerve
- Radial nerve, superficial branch
- Medial and lateral Terminal Branches

* STARS SHOW MOST COMMON SITES FOUND, SPOTS SHOW LESS COMMON SITES.

CUTANEOUS NERVES OF THE UPPER LIMB
THE CUTANEOUS NERVES OF THE RIGHT LOWER LIMB, THEIR AREAS OF DISTRIBUTION AND SEGMENTAL ORIGINS, VIEWED FROM THE ANTERIOR ASPECT. NOTE COMMUNICATION OF ALL NERVES.
The cutaneous nerves of the right lower limb and their areas of distribution and segmental origins, viewed from the posterior aspect.
EXHIBIT # 17. LEG - POSTERIOR VIEW

Cutaneous branches of dorsal rami
(Superior Clinical Nerves)

Cutaneous branches of dorsal rami
(Medial Clinical Nerves)

Perforating cutaneous n. (S.2, 3)
Post. cutaneous n. of thigh,
perineal branch

Cutaneous br. of obturator nerve

Medial cutaneous nerve
of thigh, post. branch

Post. cutaneous n. of thigh,
end branch

Lat. sural cutaneous nerve
(Cutan. br. of lat. popliteal n.)
(Lateral Cutaneous Nerve of Calf)

Branch of saphenous nerve

Med. sural cutaneous nerve
(Cutan. br. of med. popliteal n.)

Branch of saphenous nerve

Sural nerve

Medial calcanean nerve

Dorsal lateral cutaneous nerve of foot-
termination of the sural nerve

CUTANEOUS NERVES OF THE LOWER LIMB,
BACK VIEW
The fascia lata semidigramatic showing the posterior primary rami perforating through round lacunae.

The fascia is now put on the stretch due to the movement of the posterior superior iliac spine. The now oval lucanae are shown pinching the nerves. The lines of force are clearly shown.